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June 1, 2001
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FAA-STD-026
August 4, 1993

U.S. Department of Transportation

Federal Aviation Administration

Standard

Software Development
for the
National Airspace System
(NAS)

Department of Transportation
Washington, DC 20591

NAS Software Development Standard

1. This standard has been approved by the Federal Aviation Administration (FAA).

2. Comments and pertinent data for use in improving this document should be addressed to:

Department of Transportation
Federal Aviation Administration
Office of Information Services and
Chief Information Officer, AIO-1
800 Independence Ave., S.W.
Washington, DC 20591

FOREWORD

1. This standard sets forth process and documentation guidance for software development projects for the NAS. The use of this standard for all other software development projects, both internal and external to the FAA, is optional.

2. This standard will be reviewed (and updated as required) for consistency with the referenced IEEE/EIA standards as they are revised.

3. It is not intended that this standard discourage the use of particular, specialized software development processes and practices necessary to achieve project requirements.

4. This standard, together with the referenced IEEE/EIA standards, provide the means for acquiring, developing, evaluating and maintaining quality software products.

TABLE OF CONTENTS

APPENDICES

ATTACHMENTS

1. SCOPE

1.1 Scope. This standard establishes requirements for software development associated with NAS acquisition. It represents the FAA approved tailoring of IEEE/EIA 12207 and documentation standards (DIDs). This standard can be used for all software development projects external or internal to the FAA.

1.2 Purpose. The purpose of this standard is to establish and communicate requirements to be applied during the development and support of computer software.

1.3 Application. When referenced in the contract or specification, this standard shall apply to the development of computer software and related documentation. It applies to software as a stand-alone product or as a subsystem of a specified product. It applies to software delivered to the FAA including nondevelopmental software (see section 4.4), as well as software developed as an essential component of performing contract requirements (such as tools developed during contract performance). Development and delivery of documents listed herein is not intended to be automatic, i.e. document requirements must be implemented by contract (see section 5.0).

1.4 Software quality assurance. Application of this standard must be coordinated with the requirements of ISO 9001 to ensure a complete software quality program.

1.5 Software configuration management. Application of this standard must be coordinated with all other configuration management and baseline management requirements contained in the contract.

1.6 Firmware. This standard applies to the development of the software element of firmware only.

1.7 Software metrics. Application of this standard must be coordinated with all other measurement requirements contained in the contract.

1.8 Required external documents. This standard imposes requirements contained within IEEE/EIA 12207.0-1996, 12207.1-1997 and 12207.2-1997 as tailored for specific FAA needs. The material contained within these IEEE/EIA standards has not been reproduced here and requires the user to purchase authorized copies of the referenced IEEE/EIA standards. Please refer to the IEEE web page for additional information: http://www.ieee.org/

1.9 Data Item Descriptions. Data Item Descriptions (DIDs) applicable to this standard are listed in Appendix A. Additional information on the relationship of these DIDs to 12207.0 requirements and 12207.1 equivalent documents is contained in Appendix B.

1.10 Software developed by Government agencies. The provisions of this standard may be applied to Government agencies, when a Government agency performs software development for the FAA.

1.11 Tailoring of this standard. This standard represents the FAA approved tailoring of IEEE/EIA 12207. Tailoring of documentation requirements should be accomplished by the FAA acquisition officials prior to soliciting proposals.

The tailoring of this standard is consistent with the processes and practices encouraged within the FAA-iCMM version 1.0

2. REFERENCED DOCUMENTS

2.1 Government documents. None.

2.2 Industry standards. The following Industry Standards form a part of this standard to the extent specified herein:

a. IEEE/EIA 12207.0 – 1996	Software Life Cycle Processes
b. IEEE/EIA 12207.1 – 1997	Software Life Cycle Processes – Life Cycle Data
c. IEEE/EIA 12207.2 – 1997	Software Life Cycle Processes – Implementation Considerations
d. ISO 9001 – 2000	Quality Management Systems - Requirements

2.3 Order of precedence. In the event of conflict between the documents listed herein and the contents of this standard, the contents of this standard shall be the superseding requirement.

3. DEFINITIONS

The terminology as defined by IEEE/EIA 12207.0 section 3, and IEEE/EIA 12207.2 section 3 will be used in the application of this standard, unless specifically altered by contract.

4. REQUIREMENTS

The following represents an FAA tailoring of the IEEE/EIA 12207.0 and IEEE/EIA 12207.2 for the procurement of computer software products and services. Only the sections specifically identified herein are requirements of this FAA standard. However, application of the remaining sections of the 12207 model is encouraged.

It is intended that all subsections apply when a higher level section is identified as applicable, unless specifically stated.

4.1 Primary life cycle processes. The requirements of this section shall be in accordance with section 5.3 “Development Process” of IEEE/EIA 12207.0.

4.2 Supporting processes. The requirements of this section shall be in accordance with sections 6.1 “Documentation Process”, 6.2 “Configuration Management Process” and 6.3 “Quality Assurance Process” of IEEE/EIA 12207.0.

4.3 Organizational life cycle processes. The requirements of this section shall be in accordance with section 7.1 “Management Process” of IEEE/EIA 12207.0.

4.4 Nondevelopmental software (NDS). All software not developed under the contract (including, but not limited to, tools and commercially available software applications – COTS) is regarded as nondevelopmental. All NDS shall be identified and shall be addressed within required software development activities and documentation. Validation that the NDS performs its required functions and operates correctly within the software system design shall be accomplished.

4.5 Other. The guidance contained within Annexes F and J of IEEE/EIA 12207.0 are applicable to this standard, and the guidance contained within IEEE/EIA 12207.2 may be used in the implementation of this standard.

5. NOTES

5.1 The documents identified in Appendix A as “Supplemental” do not have a specific relationship to the IEEE/EIA 12207.0 and 12207.1 documentation requirements, as noted in Appendix B. However, no conflict in requirements arises in the use of these documents and their use may be warranted by the project.

5.2 The development and delivery of the documents in Appendix A are not intended to be automatic. Documentation requirements will be as identified in the contract Statement of Work (SOW) and the Contract Data Requirements List (CDRL).

APPENDIX A
Version description for Data Item Descriptions (DIDs)

Title	Number	Version
Primary Documents		
Software Development Plan (SDP)	DID-FAA-026-01	1.0
Software Installation Plan (SIP)	DID-FAA-026-02	1.0
Program Management Plan (PMP)	DID-FAA-026-04	1.0
System/Subsystem Specification (SSS)	DID-FAA-026-05	1.0
System/Subsystem Design Description (SSDD)	DID-FAA-026-06	1.0
Software Requirements Specification (SRS)	DID-FAA-026-07	1.0
Interface Requirements Specification (IRS)	DID-FAA-026-08	1.0
Software Design Description (SDD)	DID-FAA-026-09	1.0
Interface Design Description (IDD)	DID-FAA-026-10	1.0
Database Design Description (DBDD)	DID-FAA-026-11	1.0
Software Test Plan (STP)	DID-FAA-026-12	1.0
Software Test Procedures (STPr)	DID-FAA-026-13	1.0
Software Test Report (STR)	DID-FAA-026-14	1.0
Software Product Specification (SPS)	DID-FAA-026-15	1.0
Software Version Description (SVD)	DID-FAA-026-16	1.0
Software Quality Assurance Plan (SQAP)	DID-FAA-026-23	1.0
Software Configuration Management Plan (SCMP)	DID-FAA-026-24	1.0
Supplemental Documents		
Software Transition Plan (STrP)	DID-FAA-026-03	1.0
Software User Manual (SUM)	DID-FAA-026-17	1.0
Software Center Operator Manual (SCOM)	DID-FAA-026-18	1.0
Software Input/Output Manual (SIOM)	DID-FAA-026-19	1.0
Computer Operation Manual (COM)	DID-FAA-026-20	1.0
Computer Programmer's Manual (CPM)	DID-FAA-026-21	1.0
Firmware Support Manual (FSM)	DID-FAA-026-22	1.0
Computer Program Functional Specification (CPFS)	DID-FAA-026-25	1.0

APPENDIX B

Mapping of FAA-STD-026 data requirements to IEEE/EIA 12207

Number:	Title:	IEEE/EIA 12207.1 Equivalent Documents:	IEEE/EIA 12207.0/2 Ref:
DID-FAA-026-01	Software Development Plan (SDP)	Development Process Plan; Software Development Standards Description; Software Engineering Methods, Procedures, Tools Description; Software Integration Plan; Software Life Cycle Model Description	5.2.4.2, 5.3.1.1, 5.3.1.3, 5.3.1.4, 5.3.8.1, 5.3.8.5
DID-FAA-026-02	Software Installation Plan (SIP)	Software Installation Plan	5.3.12.1
DID-FAA-026-03	Software Transition Plan (STrP)	NONE	N/A
DID-FAA-026-04	Program Management Plan (PMP)	Project Management Plan	5.2.4.3, 5.2.4.4, 5.2.4.5
DID-FAA-026-05	System/Subsystem Specification (SSS)	System Requirements Specification	5.1.1.2, 5.3.2.1, 5.3.2.2
DID-FAA-026-06	System/Subsystem Design Description (SSDD)	System Architecture and Requirements Allocation Description	5.3.3.1, 5.3.3.2
DID-FAA-026-07	Software Requirements Specification (SRS)	Software Requirements Description	5.1.1.4, 5.3.4.1, 5.3.4.2
DID-FAA-026-08	Interface Requirements Specification (IRS)	Software Requirements Description	5.1.1.4, 5.3.4.1, 5.3.4.2
DID-FAA-026-09	Software Design Description (SDD)	Software Architecture Description; Software Design Description	5.3.5.1, 5.3.5.6, 5.3.6.1, 5.3.6.7
DID-FAA-026-10	Interface Design Description (IDD)	Software Interface Design Description	5.3.5.2, 5.3.6.2
DID-FAA-026-11	Database Design Description (DBDD)	Database Design Description	5.3.5.3, 5.3.6.3, 5.3.7.1
DID-FAA-026-12	Software Test Plan (STP)	Test or Validation Plan	5.3.5.5, 5.3.6.5, 5.3.6.6, 5.3.7.4, 5.3.7.5, 6.5
DID-FAA-026-13	Software Test Procedures (STPr)	Test or Validation Procedures	5.1.5.1, 5.3.7.1, 5.3.8.1, 5.3.8.4, 5.3.8.5, 5.3.10.2, 6.5
DID-FAA-026-14	Software Test Report (STR)	Test or Validation Results Report	5.3.7.2, 5.3.8.2, 5.3.9.1, 5.3.10.1, 5.3.11.1, 5.3.13.1, 6.5
DID-FAA-026-15	Software Product Specification (SPS)	Software Product Description	5.3.1.2.e, 6.2.2.1
DID-FAA-026-16	Software Version Description (SVD)	Software Product Description	5.3.1.2.e
DID-FAA-026-17	Software User Manual (SUM)	NONE	N/A
DID-FAA-026-18	Software Center Operator Manual (SCOM)	NONE	N/A
DID-FAA-026-19	Software Input/Output Manual (SIOM)	NONE	N/A
DID-FAA-026-20	Computer Operation Manual (COM)	NONE	N/A
DID-FAA-026-21	Computer Programmer's Manual (CPM)	NONE	N/A
DID-FAA-026-22	Firmware Support Manual (FSM)	NONE	N/A
DID-FAA-026-23	Software Quality Assurance Plan (SQAP)	Software Quality Assurance Plan	6.3.1.3
DID-FAA-026-24	Software Configuration Management Plan (SCMP)	Software Configuration Management Plan	6.2.1.1
DID-FAA-026-25	Computer Program Functional Specification (CPFS)	NONE	N/A

APPENDIX C
Acknowledgements

Dr. Arthur Pyster, Deputy CIO and Mr. Richard Boe, Manager, Information Technology Division ASU-500, sponsored the development of this standard. We all thank you for your encouragement and support in helping to move FAA software development standards toward “state of the practice.”

The following persons participated in authoring the material for this standard and associated data item descriptions (unless noted, they are employees of the FAA):

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Tom Marker, FAA
Uma Ferrell, Ferrell and Associates Consulting, Inc.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE DEVELOPMENT PLAN (SDP)	DID-FAA-STD-026-01

3. DESCRIPTION/PURPOSE

3.1 The Software Development Plan (SDP) describes a developer's plans for conducting a software development effort. The term "software development" in this DID is meant to include new development, modification, reuse, reengineering, maintenance, and all other activities resulting in software products.

3.2 The SDP provides the acquirer insight into, and a tool for monitoring, the processes to be followed for software development, the methods to be used, the approach to be followed for each activity, and project schedules, organization, and resources.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to develop and record plans for conducting software development activities.

7.3 Portions of this plan may be bound separately if this approach enhances their usability. Examples include plans for software configuration management and software quality assurance.

7.4 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
None	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents, including other project plans, may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support organization; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

1.4 Relationship to other plans. This paragraph shall describe the relationship, if any, of the SDP to other project management plans.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this plan. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Overview of required work. This section shall be divided into paragraphs as needed to establish the context for the planning described in later sections. It shall include, as applicable, an overview of:

a. Requirements and constraints on the system and software to be developed
b. Requirements and constraints on project documentation
c. Position of the project in the system life cycle
d. The selected program/acquisition strategy or any requirements or constraints on it
e. Requirements and constraints on project schedules and resources
f. Other requirements and constraints, such as on project security, privacy, safety, methods, standards, interdependencies in hardware and software development, etc.

4. Plans for performing general software development activities. This section shall be divided into the following paragraphs. Provisions corresponding to non-required activities may be satisfied by the words "Not applicable." If different builds or different software on the project require different planning, these differences shall be noted in the paragraphs. In addition to the content specified below, each paragraph shall identify applicable risks/uncertainties and plans for dealing with them.

4.1 Software development strategy and schedule. This paragraph shall describe the strategy, as defined in the contract or selected appropriate to the scope, magnitude, and complexity of the project. A mapping of the activities and tasks of the development process onto the strategy model shall be provided, including schedule and resource loading. The methodology used for software estimation, including any tools utilized, shall be described. The planning

shall cover all contractual clauses concerning this topic, identifying planned builds, if applicable, their objectives, and the software development activities to be performed in each build.

4.2 General plans for software development. This paragraph shall be divided into the following subparagraphs.

4.2.1 Software development methods and software products. This paragraph shall describe or reference the software development methods to be used, and describe or reference the standards to be followed for representing requirements, design, code, test cases, test procedures, and test results. Included shall be descriptions of the manual and automated tools and procedures to be used in support of these methods. The methods shall cover all contractual clauses concerning this topic. Reference may be made to other paragraphs in this plan if the methods are better described in context with the activities to which they will be applied.

a) Description of methods used to allocate system requirements, to develop the software requirements, architecture, and design, including level of detail, and methods used to implement the source code and executable object code;
b) Notations used to describe the system requirements and architecture;
c) Notations used to describe the software requirements, architecture, design modules, design limitations, and code, including identification of the programming language(s) or subset used and reference to the definition of the language syntax, control and data behavior, and side-effects;
d) Naming conventions for requirements, design, and source code, including executable object code files, and data;
e) Methods of design and coding standards, and constraints on design and code constructs and expressions, including design and code complexity restrictions and quality criteria for assessing requirements and design data and code;
f) Methods for ensuring that project participants understand software development issues and changes to requirements, design;
g) Presentation conventions and content standards for requirements data, design data, source code and test data;
h) Description of methods, tools and standards used to develop safety assurance software (if applicable);
i) Description of methods, tools and standards used to develop security assurance software;
j) Description of methods, tools and standards for software human factors;
k) Description of methods and tools used to define traceability between system requirements, system architecture, software requirements, software architecture, design, code, and test elements;
l) Description of methods, tools, and standards for testing.

4.2.2 Software Process Improvement Activities. This paragraph shall describe the methods to be used to identify improvement opportunities in software development practices and to identify any plans for increasing the level of maturity of contractor software development processes.

4.2.3 Reusable software products. This paragraph shall be divided into the following subparagraphs.

4.2.3.1 Incorporating reusable software products. This paragraph shall describe the approach to be followed for identifying, evaluating, and incorporating reusable software products, including the scope of the search for such products and the criteria to be used for their evaluation. It shall cover all contractual clauses concerning this topic. Candidate or selected reusable software products known at the time this plan is prepared or updated shall be identified and described, together with benefits, drawbacks, and restrictions, as applicable, associated with their use.

4.2.3.2 Developing reusable software products. This paragraph shall describe the approach to be followed for identifying, evaluating, and reporting opportunities for developing reusable software products. It shall cover all contractual clauses concerning this topic.

4.2.4 Handling of critical requirements. This paragraph shall be divided into the following subparagraphs, as applicable, to describe the approach to be followed for handling requirements designated critical. The planning in each subparagraph shall cover all contractual clauses concerning the identified topic.

4.2.4.1 Safety assurance
4.2.4.2 Security assurance
4.2.4.3 Privacy assurance
4.2.4.4 Human Factors
4.2.4.5 Assurance of other critical requirements

4.2.5 Computer hardware resource utilization. This paragraph shall describe the approach to be followed for allocating computer hardware resources and monitoring their utilization. It shall cover all contractual clauses concerning this topic.

4.2.6 Recording rationale. This paragraph shall describe the approach to be followed for recording rationale that will be useful to the support agency for key decisions made on the project. The rationale should include trade-offs considered, analysis methods, and criteria used to make those decisions. It shall interpret the term "key decisions" for the project and state where the rationale are to be recorded. It shall cover all contractual clauses concerning this topic.

4.2.7 Access for acquirer review. This paragraph shall describe the approach to be followed for providing the acquirer or its authorized representative access to developer and subcontractor facilities for review of software products and activities. It shall cover all contractual clauses concerning this topic.

5. Plans for performing detailed software development activities. This section shall be divided into the following paragraphs. Provisions corresponding to non-required activities may be satisfied by the words "Not applicable." If different builds or different software on the project require different planning, these differences shall be noted in the paragraphs. The

discussion of each activity shall include the approach (methods/procedures/tools) to be applied to: 1) the analysis or other technical tasks involved, 2) the recording of results, and 3) the preparation of associated deliverables, if applicable. The discussion shall also identify applicable risks/uncertainties and plans for dealing with them. Reference may be made to 4.2.1 if applicable methods are described there.

5.1 Project planning and oversight. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for project planning and oversight. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

- 5.1.1 Software development planning (covering updates to this plan)
- 5.1.2 Software test planning
- 5.1.3 System test planning
- 5.1.4 Software installation planning
- 5.1.5 Software transition planning
- 5.1.6 Following and updating plans, including the intervals for management review

5.2 Establishing a software development environment. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for establishing, controlling, and maintaining a software development environment. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

- 5.2.1 Software engineering environment
- 5.2.2 Software test environment
- 5.2.3 Software development library
- 5.2.4 Software development files
- 5.2.5 Non-deliverable software

5.3 System requirements analysis. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system requirements analysis. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

- 5.3.1 Analysis of user input
- 5.3.2 Operational concept
- 5.3.3 System requirements

5.4 System design. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system design. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

- 5.4.1 System-wide design decisions
- 5.4.2 System architectural design

5.5 Software requirements analysis. This paragraph shall describe the approach to be followed for software requirements analysis. The approach shall cover all contractual clauses concerning this topic.

5.6 Software architectural design. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software design of each software item (or software configuration item, if identified). The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.6.1 Software design decisions
5.6.2 Software top-level architectural design

5.7 Software detailed design. This paragraph shall describe the approach to be followed for software detailed design.

5.8 Software coding and testing. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software coding and testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.7.1 Software implementation
5.7.2 Preparing for unit testing
5.7.3 Performing unit testing
5.7.4 Revision and retesting
5.7.5 Analyzing and recording unit test results

5.8 Software integration. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed to integrate the software units and software components into the software item. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.8.1 Preparing the software integration plan including
- description of the test environment
- test requirements
- test procedures
- test data recording and analysis
- responsibilities
- schedule

5.8.2 Performing software integration
5.8.3 Revision and retesting
5.8.4 Analyzing and recording software integration and test results

5.9 Software qualification testing. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software qualification testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.9.1 Independence in CSCI qualification testing
5.9.2 Testing on the target computer system
5.9.3 Preparing for software qualification testing
5.9.4 Dry run of software qualification testing
5.9.5 Performing software qualification testing
5.9.6 Revision and retesting
5.9.7 Analyzing and recording software qualification test results

5.10 System integration. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system integration. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.10.1 Testing on the target computer system
5.10.2 Preparing for system integration and testing
5.10.3 Performing system integration and testing
5.10.4 Revision and retesting
5.10.5 Analyzing and recording system integration and test results

5.11 System qualification testing. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for participating in system qualification testing. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.11.1 Independence in system qualification testing
5.11.2 Testing on the target computer system
5.11.3 Preparing for system qualification testing
5.11.4 Dry run of system qualification testing
5.11.5 Performing system qualification testing
5.11.6 Revision and retesting
5.11.7 Analyzing and recording system qualification test results

5.12 Preparing for software use. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for preparing for software use. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.12.1 Preparing the executable software
5.12.2 Preparing version descriptions for user sites
5.12.3 Preparing user manuals
5.12.4 Installation at user sites

5.13 Preparing for software transition. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for preparing for software transition. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic. If part or all of this information is provided elsewhere, the source(s) may be referenced.

5.13.1 Preparing the executable software
5.13.2 Preparing source files
5.13.3 Preparing version descriptions for the support site
5.13.4 Preparing the "as built" software design and other software support information
5.13.5 Updating the system design description
5.13.6 Preparing support manuals
5.13.7 Transition to the designated support site

5.14 Software configuration management. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software configuration management. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic. If part or all of this information is provided elsewhere, the source(s) may be referenced.

5.14.1 Configuration identification
5.14.2 Configuration control
5.14.3 Configuration status accounting
5.14.4 Configuration audits
5.14.5 Packaging, storage, handling, and delivery

5.15 Software product evaluation. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software product evaluation. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic. If part or all of this information is provided elsewhere, the source(s) may be referenced.

5.15.1 In-process and final software product evaluations
5.15.2 Software product evaluation records, including items to be recorded
5.15.3 Independence in software product evaluation

5.16 Software quality assurance. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for software quality assurance. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic. If part or all of this information is provided elsewhere, the source(s) may be referenced.

5.16.1 Software quality assurance evaluations
5.16.2 Software quality assurance records, including items to be recorded
5.16.3 Independence in software quality assurance

5.17 Corrective action. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for corrective action. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic. If part or all of this information is provided elsewhere, the source(s) may be referenced.

5.17.1 Problem/change reports, including items to be recorded (candidate items include project name, originator, problem number, problem name, software element or document affected, origination date, category and priority, description, analyst assigned to the problem, date assigned, date completed, analysis time, recommended solution, impacts, problem status, approval of solution, follow-up actions, corrector, correction date, version where corrected, correction time, description of solution implemented)

5.17.2 Corrective action system

5.18 Joint technical and management reviews. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for joint technical and management reviews. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.18.1 Joint technical reviews
5.18.2 Joint management reviews

5.19 Other software development activities. This paragraph shall be divided into the following subparagraphs to describe the approach to be followed for other software development activities. The planning in each subparagraph shall cover all contractual clauses regarding the identified topic.

5.19.1 Risk management, including known risks and corresponding strategies
5.19.2 Software management indicators, including indicators to be used
5.19.3 Security and privacy
5.19.4 Subcontractor management
5.19.5 Interface with software independent verification and validation (IV&V) agents
5.19.6 Coordination with associate developers
5.19.7 Improvement of project processes
5.19.8 Other activities not covered elsewhere in the plan

6. Schedules and activity network. This section shall present:

a. Schedule(s) identifying the activities in each build and showing initiation of each activity, availability of draft and final deliverables and other milestones, and completion of each activity

b. An activity network, depicting sequential relationships and dependencies among activities and identifying those activities that impose the greatest time restrictions on the project

7. Project organization and resources. This section shall be divided into the following paragraphs to describe the project organization and resources to be applied in each build.

7.1 Project organization. This paragraph shall describe the organizational structure to be used on the project, including the organizations involved, their relationships to one another, and the authority and responsibility of each organization for carrying out required activities.
7.2 Project resources. This paragraph shall describe the resources to be applied to the project. It shall include, as applicable:

a. Personnel resources, including:

   1) The estimated staff-loading for the project (number of personnel over time)

   2) The breakdown of the staff-loading numbers by responsibility (for example, management, software engineering, software testing, software configuration management, software product evaluation, software quality assurance)

   3) A breakdown of the skill levels, geographic locations, and security clearances of personnel performing each responsibility
   4) Training requirements by responsibility along with a plan for obtaining and ensuring training

b. Overview of developer facilities to be used, including geographic locations in which the work will be performed, facilities to be used, and secure areas and other features of the facilities as applicable to the contracted effort.

c. Acquirer-furnished equipment, software, services, documentation, data, and facilities required for the contracted effort. A schedule detailing when these items will be needed shall also be included.

d. Other required resources, including a plan for obtaining the resources, dates needed, and availability of each resource item.

8. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE INSTALLATION PLAN (SIP)	**DID-FAA-026-02**

3. DESCRIPTION/PURPOSE

3.1 The Software Installation Plan (SIP) is a plan for installing software at user sites, including preparations, user training, and conversion from existing systems.

3.2 The developer shall develop a plan to install the software product in the target environment as designated in the contract. The resources and information necessary to install the software product shall be determined and be available. As specified in the contract, the developer shall assist the acquirer with the set-up activities. Where the installed software product is replacing an existing system, the developer shall support any parallel running activities that are required by contract. The installation plan shall be documented.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for data generated under the work task described by paragraph 5.3.12 of IEEE/EIA 12207.0

7.2 FAA, Commercial, or other existing, documents may be substituted for all or part of the SIP if they contain the required data.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	**FAA-STD-026**	N/A

10. PREPARATION INSTRUCTIONS

10.1 General Instructions.

a. Automated techniques. Use of automated techniques is encouraged. The Contract Data Requirements List (CDRL, DD Form 1423 or equivalent) should specify whether the data are to be delivered on paper or electronic media; any requirements on the electronic representation (such as ASCII, CALS, or compatibility with a specified word processor or other support software).; whether the data may be delivered in developer format rather than in the format specified herein; and whether the data may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(***Continued on Page 2***)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier. When data are delivered in the form of a traditional document, the Document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data delivered in an alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. When data are delivered in the form of a traditional document, the document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data delivered in an alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. When data are delivered in the form of a traditional document, each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data delivered in an alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. When data are delivered in the form of a traditional document, paragraphs that have been tailored out of the DID shall result in the corresponding paragraph number and title in the document, followed by "This paragraph has been tailored out." For data delivered in an alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, Supplier, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this plan and shall describe any security or privacy considerations associated with its use.

1.4 Relationship to other plans. This paragraph shall describe the relationship, if any, of the SIP to other project management plans.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this plan. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Installation overview. This section shall be divided into the following paragraphs to provide an overview of the installation process.

3.1 Description. This paragraph shall provide a general description of the installation process to provide a frame of reference for the remainder of the document. A list of sites for software installation, the schedule dates, and the method of installation shall be included.

3.2 Contact point. This paragraph shall provide the organizational name, office symbol/code, and telephone number of a point of contact for questions relating to this installation.

3.3 Support materials. This paragraph shall list the type, source, and quantity of support materials/consumables needed for the installation. Included shall be items such as magnetic tapes, disk packs, computer printer paper, and special forms.

3.4 Training. This paragraph shall describe the developer's plans for training personnel who will operate and/or use the software installed at user sites. Included shall be the delineation between general orientation, classroom training, and "hands-on" training.

3.5 Tasks. This paragraph shall list and describe in general terms each task involved in the software installation. Each task description shall identify the organization that will accomplish the task, usually either the user, computer operations, or the developer. The task list shall include such items as:

a. Providing overall planning, coordination, and preparation for installation

b. Providing personnel for the installation team

c. Arranging lodging, transportation, and office facilities for the installation team

d. Ensuring that all manuals applicable to the installation are available when needed

e. Ensuring that all other prerequisites have been fulfilled prior to the installation

f. Planning and conducting training activities

g. Providing project personnel for the training

h. Providing computer support and technical assistance for the installation

i. Providing for conversion from the current system

3.6 Personnel. This paragraph shall describe the number, type, and skill level of the personnel needed during the installation period, including the need for multi-shift operation, clerical support, etc.

3.7 Security and privacy. This paragraph shall contain an overview of the security and privacy considerations associated with the system.

4. Site-specific information for software center operations staff. This section applies if the software will be installed in computer center(s) or other centralized or networked software installations for users to access via terminals or using batch inputs/outputs. If this type of installation does not apply, this section shall contain the words "Not applicable."

NOTE: x = Multiple sites

4.x (Site name). This paragraph shall identify a site or set of sites and shall be divided into the following subparagraphs to discuss those sites. Multiple sites may be discussed together when the information for those sites is generally the same.

4.x.1 Schedule. This paragraph shall present a schedule of tasks to be accomplished during installation. It shall depict the tasks in chronological order with beginning and ending dates of each task and supporting narrative as necessary.

4.x.2 Software inventory. This paragraph shall provide an inventory of the software needed to support the installation. The software shall be identified by name, identification number, version number, release number, configuration, and security classification, as applicable. This paragraph shall indicate whether the software is expected to be on site or will be delivered for the installation and shall identify any software to be used only to facilitate the installation process.

4.x.3 Facilities. This paragraph shall detail the physical facilities and accommodations needed during the installation period. This description shall include the following, as applicable:

a. Classroom, work space, and training aids needed, specifying hours per day, number of days, and shifts

b. Hardware that must be operational and available

c. Transportation and lodging for the installation team

4.x.4 Installation team. This paragraph shall describe the composition of the installation team. Each team member's tasks shall be defined.

4.x.5 Installation procedures. This paragraph shall provide step-by-step procedures for accomplishing the installation. References may be made to other documents, such as operator manuals. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable. The procedures shall include the following, as applicable:

a. Installing the software
b. Checking out the software once installed
c. Initializing databases and other software with site-specific data
d. Conversion from the current system, possibly involving running in parallel
e. Dry run of the procedures in operator and user manuals
f. QA and CM Configuration Integrity Verification Procedures, Initial, Daily, and Pre-Test

4.x.6 Data update procedures. This paragraph shall present the data update procedures to be followed during the installation period. When the data update procedures are the same as normal updating or processing procedures, reference may be made to other documents, such as operator manuals.

5. Site-specific information for software users. This section shall provide installation planning pertinent to users of the software. When more than one type of user is involved, for example, users at different positions, performing different functions, or in different organizations, a separate section (Sections 5 through n) may be written for each type of user and the section titles modified to reflect each user.

5.x (Site name). This paragraph shall identify a site or set of sites and shall be divided into the following subparagraphs to discuss those sites. Multiple sites may be discussed together when the information for those sites is generally the same.

5.x.1 Schedule. This paragraph shall present a schedule of tasks to be accomplished by the user during installation. It shall depict the tasks in chronological order including beginning and ending dates for each task and supporting narrative as necessary.

5.x.2 Installation procedures. This paragraph shall provide step-by-step procedures for accomplishing the installation. Reference may be made to other documents, such as user manuals, FAA documents. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable. The procedures shall include the following, as applicable:

a. Performing the tasks under 4.x.5 if not performed by operations staff
b. Initializing user-specific data
c. Setting up queries and other user inputs
d. Performing sample processing
e. Generating sample reports
f. Conversion from the current system, possibly involving running in parallel
g. Dry run of procedures in user manuals

5.x.3 Data update procedures. This paragraph shall be divided into subparagraphs to present the user's data update procedures to be followed during the installation period. When update procedures are the same as normal processing, reference may be made to other documents, such as user manuals, and to Section 4 of this document

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rational). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document. If section 5 has been expanded into section(s) 6,...n, this section shall be numbered as the next section following section n.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE TRANSITION PLAN (STrP)	**DID-FAA-026-03**

3. DESCRIPTION/PURPOSE

3.1 The Software Transition Plan (STrP) identifies the hardware, software, and other resources needed for life cycle support of deliverable software and describes the developer's plans for transitioning deliverable items to the support organization.

3.2 The STrP is developed if the software support concept calls for transition of responsibility from the developer to a separate support organization.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 FAA, Commercial, or other existing, documents may be substituted for all or part of the STrP if they contain the required data.

7.3 The Contract Data Requirements List (CDRL DD form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	**FAA-STD-026**	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier. When data are delivered in the form of a traditional document, the document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data delivered in an alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. When data are delivered in the form of a traditional document, the document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data delivered in an alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. When data are delivered in the form of a traditional document, each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data delivered in an alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. When data are delivered in the form of a traditional document, paragraphs that have been tailored out of the DID shall result in the corresponding paragraph number and title in the document, followed by "This paragraph has been tailored out." For data delivered in an alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support organization; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

1.4 Relationship to other plans. This paragraph shall describe the relationship, if any, of the STrP to other project management plans.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Software support resources. This section shall be divided into paragraphs to identify and describe the resources needed to support the deliverable software. These resources shall include items needed to control, copy, and distribute the software and its documentation, and to specify, design, implement, document, test, evaluate, control, copy, and distribute modifications to the software.

3.1 Facilities. This paragraph shall describe the facilities needed to support the deliverable software. These facilities may include special buildings, rooms, mock-ups, building features such as raised flooring or cabling; building features to support security and privacy requirements (vaults, etc.), building features to support safety requirements (smoke alarms, safety glass, etc.), special power requirements, and so on. The purpose of each item shall be described. Diagrams may be included as applicable.

3.2 Hardware. This paragraph shall identify and describe the hardware and associated documentation needed to support the deliverable software. This hardware may include computers, peripheral equipment, hardware simulators, stimulators, emulators, diagnostic equipment, and non-computer equipment. The description shall include:

a. Specific models, versions, and configurations

b. Rationale for the selected hardware

c. Reference to user/operator manuals or instructions for each item, as applicable

d. Identification of each hardware item and document as Government-furnished, an item that will be delivered to the support organization, an item the support organization is known to have, an item the support organization must acquire, or other description of status

e. If items must be acquired, information about a current source of supply, including whether the item is currently available and whether it is expected to be available at the time of delivery

f. Information about manufacturer support, licensing, and data rights, including whether the item is currently supported by the manufacturer, whether it is expected to be supported at the time of delivery, whether licenses will be assigned to the support organization, and the terms of such licenses

g. Security and privacy considerations, limitations, or other items of interest

3.3 Software. This paragraph shall identify and describe the software and associated documentation needed to support the deliverable software. This software may include computer-aided software engineering (CASE) tools, data in these tools, compilers, test tools, test data, simulations, emulations, utilities, configuration management tools, databases and data files, and other software. The description shall include:

a. Specific names, identification numbers, version numbers, release numbers, and configurations, as applicable

b. Rationale for the selected software

c. Reference to user/operator manuals or instructions for each item, as applicable

d. Identification of each software item and document as Government-furnished, an item that will be delivered to the support organization, an item the support organization is known to have, an item the support organization must acquire, or other description of status

e. If items must be acquired, information about a current source of supply, including whether the item is currently available and whether it is expected to be available at the time of delivery

f. Information about vendor support, licensing, and data rights, including whether the item is currently supported by the vendor, whether it is expected to be supported at the time of delivery, whether licenses will be assigned to the support organization, and the terms of such licenses

g. Security and privacy considerations, limitations, or other items of interest

3.4 Other documentation. This paragraph shall identify any other documentation needed to support the deliverable software. The list will include, for example, plans, reports, studies, specifications, design descriptions, test cases/procedures, test reports, user/operator manuals, and support manuals for the deliverable software. This paragraph shall provide:

a. Names, identification numbers, version numbers, and release numbers, as applicable

b. Rationale for including each document in the list

c. Identification of each document as Government-furnished, an item that will be delivered to the support organization, an item the support organization is known to have, an item the support organization must acquire, or other description of status

d. If a document must be acquired, information about where to acquire it

e. Information about licensing and data rights

f. Security and privacy considerations, limitations, or other items of interest

3.5 Personnel. This paragraph shall describe the personnel needed to support the deliverable software, including anticipated number of personnel, types and levels of skills and expertise, and security clearances. This paragraph shall cite, as applicable, actual staffing on the development project as a basis for the staffing needs cited.

3.6 Other resources. This paragraph shall identify any other resources needed to support the deliverable software. Included may be consumables such as magnetic tapes and diskettes, together with an estimate of the type and number that should be acquired.

3.7 Interrelationship of components. This paragraph shall identify the interrelationships of the components identified in the preceding paragraphs. A figure may be used to show the interrelationships.

4. Recommended procedures. This section shall be divided into paragraphs as needed to describe any procedures, including advice and lessons learned, that the developer may wish to recommend to the support organization for supporting the deliverable software and associated support environment.

5. Training. This section shall be divided into paragraphs as appropriate to describe the developer's plans for training support personnel to support of the deliverable software. This section shall include:

a. The schedule, duration, and location for the training

b. The delineation between classroom training and "hands-on" training

c. Provision (either directly or by reference) for:

1) Familiarization with the operational software and target computer(s)

2) Familiarization with the support software and software development environment

6. Anticipated areas of change. This section shall describe anticipated areas of change to the deliverable software.

7. Transition planning. This section shall be divided into paragraphs as needed to describe the developer's plans for transitioning the deliverable software to the support organization. This section shall address the following:

a. All activities to be performed to transition the deliverable software to the support organization. These activities may include planning/coordination meetings; preparation of items to be delivered to the support organization; packaging, shipment, installation, and checkout of the software support environment; packaging, shipment, installation, and checkout of the operational software; and training of support personnel.

b. Roles and responsibilities for each activity

c. The resources needed to carry out the transition activities and the source from which each resource will be provided

d. Schedules and milestones for conducting the transition activities. These schedules and milestones shall be compatible with the contract master schedule.

e. Verification Procedures for installation and checkout of deliverable items in the support environment

8. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
Program Management Plan (PMP)	**DID-FAA-026-04**

3. DESCRIPTION/PURPOSE

3.1 The Program Management Plan (PMP) will describe the Contractor's management organization to include interrelationships between the prime Contractor, major subcontractor(s) and the contracting activity. The Program Management Plan shall describe the Contractor's organization, program planning and scheduling tools and techniques, program tracking and control methods, resource management, production planning and management, and subcontractor management methods.

3.2 The PMP will be an all inclusive management plan providing details of the specific techniques, tasks, and procedures to be used for monitoring contract management and performance, configuration control, data management, production management, and cost control. Requirements pertaining to quality control and systematic improvement will be presented in the PMP. Software quality assurance requirements may also be addressed in the Software Quality Assurance Plan (SQAP) (DID-FAA-026-23). Requirements pertaining to configuration management will be presented in the PMP. Software configuration management requirements may also be addressed in the Software Configuration Management Plan (SCMP) (DID-FAA-026-24).

3.3 The PMP documents the Contract Work Breakdown Structure (CWBS) and its extension by the Contractor.

3.4 The PMP provides the contracting activity a basis for reviewing and evaluating of performance, and for determining contractual compliance.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID shall be the basis for the Contractor's management approach to program technical, schedule, and cost control. The PMP shall be consistent with data products generated for the direction, coordination, and control of system engineering, interface management, configuration management, quality assurance, safety, security, risk management, training, and production management.

7.3 The Contract Data Requirements List (CDRL DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Introduction. This section shall be divided into the following paragraphs.

1.1 Purpose. This paragraph shall describe the purpose of the PMP in terms of its relationship to the management of the project, and performance of the contract tasks outlined in the Statement of Work (SOW).

1.2 Overview. This section shall contain: programmatic and technical background on the system; an overview of the Contractor's approach to program technical, schedule, and cost control; authority of the program manager; and the relationship of the PMP to other programmatic policies, procedures, and planning documents; and methods of incorporating changes into the PMP.

2. Program Management. This section shall provide information on the Contractor's management organization, internal management policies and procedures, an overall integrated program schedule, relationships with Government personnel and agencies, and roles and responsibilities of management entities within the organization.

2.1 Management Organization. Present company organizational chart(s) and sufficient supplemental narrative to fully describe all organizational levels, plans and activities. This chart shall be hierarchical in nature and should delineate clearly all major area responsibilities and management positions. Provide a chart of the program organization to be used in performance of the contract. Provide a narrative describing how the Contractor shall fully integrate the management of all elements of the project. Identify key technical and management personnel who will be assigned to the project. If the project includes major subcontractors, provide organizational information about the subcontractor and include subcontractor organizational elements in the project organization chart.

2.2 Roles and Responsibilities. Discuss the authority of all responsible management positions identified by the organizational description. This description shall include the role of the project manager to direct, control, and commit resources to adequately fulfill their responsibilities.

2.3 Policies and Procedures. Describe internal policies and procedures to be used in managing the contract.

2.4 Relationships. Describe the working relationships the Contractor will establish with the Government (FAA) and any subcontractors supporting the procurement of the system.

2.5 Subcontract Management. Describe the approach to managing subcontractor activities. Include in the approach the organizational relationship maintained between the prime and subcontractors and methods of requirement flow-down and activity progress reporting back to the prime Contractor. Describe subcontractor and supplier rating systems used to select subcontractors and describe the approach to maintaining quality from products produced by subcontractors.

3. Contract Work Breakdown Structure. The PMP shall include the contract work breakdown structure (CWBS). The complete work breakdown structure (WBS) will serve as a basis for program and technical planning, scheduling, cost estimating, resource allocations, performance management, configuration management, and status reporting. The CWBS shall identify all subcontracted elements or tasks and shall include an index and dictionary.

3.1 CWBS Index. The CWBS shall contain the data elements listed below:

Line number for each CWBS sequential starting with 1.

Title of the CWBS element (using the specific name or nomenclature, when applicable), intended to reflect the level. Level 1 is the total contract. Levels 2, 3, etc. are successively lower levels of the program.

CWBS code.

- Contract line item(s) associated with the CWBS element,
- Statement of work (SOW) paragraph numbers(s).

3.2 CWBS Dictionary. The CWBS dictionary shall describe the effort and tasks associated with every CWBS element. Provide a complete description of the technical and cost content of each CWBS element. The definition shall describe the efforts, tasks, tests, components, etc., that are included in the CWBS element by the Contractor.

4. Schedule. Present a baseline schedule and processes for control of the schedule.

4.1 Baseline Schedule. Present a Baseline Master Integrated Project Schedule (BMIPS) that shall include all formal reviews and audits, all key programmatic and technical events, and the preliminary and final submission of all documentation identified in the Contract Data Requirements List (CDRL). Include developmental and production processes discussed in the plan. The schedule shall show task dependencies and interrelationships and shall be tied to the WBS and CWBS. Schedules shall be presented in summary, intermediate, and detailed levels tied to CWBS work elements.

4.2 Summary master schedules. A graphical display of top level program activities and key milestones that depict major work activities in an integrated fashion at the summary level of the CWBS.

4.3 Intermediate schedules. A graphical display of top level program activities and key milestones that depict major work activities in a major CWBS element.

4.4 Detailed schedules. A graphical display of detailed activities and milestones that depict work activities in a particular CWBS element.

4.5 Schedule Management. Provide a detailed description of how the Contractor will implement a fully integrated, defined, planning and control system. The description shall include discussion of interrelationship of tasks, and tracking criticality of tasks. If subcontractor(s) are used, similar information shall be presented and shall include a discussion on how Contractor and subcontractor schedules shall be integrated and updated.

5. Resource Planning. Provide a detailed description of how the Contractor will allocate and plan resources to meet the delivery requirements of the project. Discuss any resource planning tools used for this purpose.

6. Metrics. Describe the management indicators (metrics) that will be used to track contract performance and contract work breakdown structure (CWBS) activities throughout the contract life cycle. Include description of contract metrics (e.g. Earned Value metrics) used to monitor cost and schedule progress in a cost plus environment.

7. Risk Management. Describe the internal approach and method for the identification, assessment, and mitigation of program risks. This approach should include provision for identifying risk areas, assessing risk factors, assigning appropriate resources to reduce risk factors, identifying and analyzing alternative actions available, identifying the most promising alternatives, and planning for implementation of risk reduction. Identify and assess each possible area of risk to the program, applying the internal risk reduction procedure. Describe your procedures to develop a plan of action to mitigate risk when management indicators (metrics) show a deviation of 10% or greater between planned and actual indicators.

8. Data Management. Describe the organization, procedures, and tools to be used to ensure that all data deliverables required by the contract are made in a timely manner. Identify the individual responsible for integrating and maintaining the total data management effort. This effort shall involve monitoring, reporting, status accounting, and development of a cross-matrix (e.g. Government change requirements versus implemented changes) of all changes to, additions to, or deletions from CDRL contents. The Contractor's procedures for controlling the generation, receipt, approval, storage, and delivery of subcontractor data (as well as its inclusion in status accounting) shall also be described.

9. Configuration Management Plan. This section shall describe the Contractor's configuration management (CM) Plan, how the contractor's CM program is organized, how it will be conducted, and the methods, procedures and controls used to assure effective configuration , identification, change control, status accounting, and audits of the total configuration, including hardware, software and firmware.

9.1 Configuration management phasing and milestones. This section shall describe and graphically portray the sequence of events and milestones for implementation of CM in phase with major program milestones and events, including:

a. Release and submittal of configuration documentation in relation to program events (e.g., technical reviews);
b. Establishment of internal developmental configuration and contractual baselines;
c. Implementation of internal and Government configuration control;
d. Establishment of configuration control boards;
e. Implementation of a status accounting information system and provision of reports/or access to the status accounting information; and
f. Conduct of configuration audits.

9.2 Configuration identification. This section shall describe the Contractor's procedures for meeting the requirements of Statement of Work (SOW) requirements related to configuration management, including:

a. Selection of Configuration Item(s) (CI) ;
b. Establishment and management of developmental configuration including document, drawing and software development libraries and corrective action process ;
c. Establishment of contract baselines, definition of the configuration documentation required for each and graphic illustration of configuration documentation relationships;
d. Engineering release and correlation of manufactured products; and
e. Assignment and application of configuration identifiers including document numbers, nomenclature, serial numbers and part number to hardware; and software identifiers to software and firmware.

9.3 Configuration control. This section shall describe the Contractor's procedures for meeting Statement of Work (SOW) requirements related to configuration management, including:

a. Functions, responsibility, and authority of configuration control boards;
b. Classification of changes, and the level of authority for change approval/concurrence;
c. Processing of Class I Engineering Change Proposals (ECPs) and Value Engineering Change Proposals (VECPs);
d. Processing of Class II ECPs;
e. Processing of Requests for Deviations and Waivers; and
f. Processing of Specification Change Notices (SCNs)

9.4 Configuration status accounting. This section shall describe the Contractor's procedures including:

a. The Contractor's methods for collecting, recording, processing and maintaining data necessary to provide contractual status accounting information via reports and/or data base access;
b. Description of reports/information system content related to, as applicable:
- Identification of current approved configuration documentation and configuration identifiers associated with each CI;
- Status of proposed engineering changes from initiation to implementation;
- Results of configuration audits; status and disposition of discrepancies;
- Status of requests for critical and major deviations and waivers;
- Traceability of changes from baseline documentation of each CI; and
- Effectively and installation status of configuration changes to all CIs at all locations.

c. Methods of accessing the accounting information systems and/or frequency of reporting and distribution.
d. Description of the tool used to accomplish status accounting.

9.5 Configuration audits. This section shall describe the Contractor's approach to meeting Statement of Work (SOW) requirements related to configuration management, including: plans, procedures, documentation, and schedules for functional and physical configuration audits; and format for reporting results of in-process configuration audits.

10. Quality Control, Performance Evaluation, and Contractual Compliance. This section shall discuss Contractor and major subcontractor(s) methods and concepts for continuous quality control, performance evaluation, and contractual compliance.

10.1 Special Boards, Teams, and Working Groups. Discuss the purpose and responsibilities of all special boards, teams, or working groups to be used by the Contractor to control technical or managerial performance.

10.2 Reviews and Reporting. Describe plans for all formal and informal reviews and reporting to the Government.

10.3 Systematic Improvement. Describe the approach to systematic improvement of products. Include in the discussion the approach to supplying quality products and making continuous improvement to critical processes controlled by the organization Describe the tools and techniques which are used or planned for use on this contract. Include any discussion of relevant experience in the area of systematic improvement.

11. Production Management. This section shall discuss Contractor and major subcontractor(s) methods and concepts for employing facilities, tooling, and manpower resources to produce the system/equipment.

11.1 Manufacturing Methods and Production Flow. Provide a production flow utilizing a goes-into chart, tree chart or equivalent to detail the process for manufacturing and assembly in terms of key operations or assembly points showing individual and total lead times from the procurement of raw material to delivery of the end item.

11.2 Make or Buy. This section shall identify each item and rationale for all major make/buy decisions and identify single or sole source suppliers with a backup plan, long lead materials, any critical materials and vendor control.

11.3 Capability and Capacity. This section shall describe the data and information used to determine the Contractor and subcontractor(s) capability and capacity to meet schedule requirements. The Contractor shall provide data indicating ability to meet the production rate and quantity for the system. Manufacturing risks and the systems used to track suppliers' progress and to detect/correct potential delivery problems shall also be addressed. Provide a list of all subcontractors and major vendors indicating the services/materials to be supplied by each.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
System/Subsystem Specification (SSS)	**DID-FAA-026-05**

3. DESCRIPTION/PURPOSE

3.1 The System/Subsystem Specification (SSS) specifies the requirements for a system or subsystem and the methods to be used to ensure that each requirement has been met. Requirements pertaining to the system or subsystem's external interfaces may be presented in the SSS or in one or more Interface Requirements Specifications (IRSs) (DID-FAA-026-08) referenced from the SSS.

3.2 The SSS, possibly supplemented by IRSs, is used as the basis for design and qualification testing of a system or subsystem. Throughout this DID, the term "system" may be interpreted to mean "subsystem" as applicable. The resulting document should be titled System Specification or Subsystem Specification (SSS).

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the requirements to be met by a system or subsystem.

7.3 Requirements pertaining to system or subsystem interfaces may be presented in the SSS or in IRSs.

7.4 The Contract Data Requirements List (CDRL) (DD form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system to which this document applies. It shall describe the general nature of the system; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this specification. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Requirements. This section shall be divided into the following paragraphs to specify the system requirements, that is, those characteristics of the system that are conditions for its acceptance. Each requirement shall be assigned a project-unique identifier to support testing and traceability and shall be stated in such a way that an objective test can be defined for it. Each requirement shall be annotated with associated qualification method(s) (see section 4) and, for subsystems, traceability to system requirements (see section 5.a), if not provided in those sections. The degree of detail to be provided shall be guided by the following rule: Include those characteristics of the system that are conditions for system acceptance; defer to design descriptions those characteristics that the acquirer is willing to leave up to the developer. If there are no requirements in a given paragraph, the paragraph shall so state. If a given requirement fits into more than one paragraph, it may be stated once and referenced from the other paragraphs. Each system requirement shall be evaluated for traceability to FAA needs, consistency with the project needs, testability, feasibility of system architectural design and feasibility of operation and maintenance.

3.1 Required states and modes. If the system is required to operate in more than one state or mode having requirements distinct from other states or modes, this paragraph shall identify and define each state and mode. Examples of states and modes include: idle, ready, active, post-use analysis, training, degraded, emergency, backup, etc. The distinction between states and modes is arbitrary. A system may be described in terms of states only, modes only, states within modes, modes within states, or any other scheme that is useful. If no states or modes are required, this paragraph shall so state, without the need to create artificial distinctions.

If states and/or modes are required, each requirement or group of requirements in this specification shall be correlated to the states and modes. The correlation may be indicated by a table or other method in this paragraph, in an appendix referenced from this paragraph, or by annotation of the requirements in the paragraphs where they appear.

3.2 System capability requirements. This paragraph shall be divided into subparagraphs to itemize the requirements associated with each capability of the system. A "capability" is defined as a group of related requirements. The word "capability" may be replaced with "function," "subject," "object," or other term useful for presenting the requirements.

3.2.x (System capability). This paragraph shall identify a required system capability and shall itemize the requirements associated with the capability. If the capability can be more clearly specified by dividing it into constituent capabilities, the constituent capabilities shall be specified in subparagraphs. The requirements shall specify required behavior of the system and shall include applicable parameters, such as response times, throughput times, other timing constraints, sequencing, accuracy, capacities (how much/how many), priorities, continuous operation requirements, and allowable deviations based on operating conditions. The requirements shall include, as applicable, required behavior under unexpected, unallowed, or "out of bounds" conditions, requirements for error handling, and any provisions to be incorporated into the system to provide continuity of operations in the event of emergencies. Paragraph 3.3.x of this DID provides a list of topics to be considered when specifying requirements regarding inputs the system must accept and outputs it must produce.

3.3 System external interface requirements. This paragraph shall be divided into subparagraphs to specify the requirements, if any, for the system's external interfaces. This paragraph may reference one or more Interface Requirements Specifications (IRSs) or other documents containing these requirements.

3.3.1 Interface identification and diagrams. This paragraph shall identify the required external interfaces of the system. The identification of each interface shall include a project-unique identifier and shall designate the interfacing entities (systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided to depict the interfaces.

3.3.x (Project-unique identifier of interface). This paragraph (beginning with 3.3.2) shall identify a system external interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into subparagraphs as needed to state the requirements imposed on the system to achieve the interface. Interface characteristics of the other entities involved in the interface shall be stated as assumptions or as "When [the entity not covered] does this, the system shall...," not as requirements on the other entities. This paragraph may reference other documents (such as data dictionaries, standards for communication protocols, and standards for user interfaces) in place of stating the information here.

PREPARATION INSTRUCTIONS – 10.2 Content requirements (continued)

The requirements shall include the following, as applicable, presented in any order suited to the requirements, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority that the system must assign the interface

b. Requirements on the type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

c. Required characteristics of individual data elements that the system must provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., variable or field name in code or database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)

d. Required characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the system must provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural language) name
        c) Technical name (e.g., record or data structure name in code or database)
        d) Abbreviations or synonymous names
    2) Data elements in the assembly and their structure (number, order, grouping)
    3) Medium (such as disk) and structure of data elements/assemblies on the medium
    4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)

5) Relationships among assemblies, such as sorting/access characteristics
6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
7) Security and privacy constraints
8) Sources (setting/sending entities) and recipients (using/receiving entities)

e. Required characteristics of communication methods that the system must use for the interface, such as:
1) Project-unique identifier(s)
2) Communication links/bands/frequencies/media and their characteristics
3) Message formatting
4) Flow control (such as sequence numbering and buffer allocation)
5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
6) Routing, addressing, and naming conventions
7) Transmission services, including priority and grade
8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Required characteristics of protocols the system must use for the interface, such as:
1) Project-unique identifier(s)
2) Priority/layer of the protocol
3) Packeting, including fragmentation and reassembly, routing, and addressing
4) Legality checks, error control, and recovery procedures
5) Synchronization, including connection establishment, maintenance, termination
6) Status, identification, and any other reporting features

g. Other required characteristics, such as physical compatibility of the interfacing entities (dimensions, tolerances, loads, plug compatibility, etc.), voltages, etc.

3.4 System internal interface requirements. This paragraph shall specify the requirements, if any, imposed on interfaces internal to the system. If all internal interfaces are left to the design or to requirement specifications for system components, this fact shall be so stated. If such requirements are to be imposed, paragraph 3.3 of this DID provides a list of topics to be considered.

3.5 System internal data requirements. This paragraph shall specify the requirements, if any, imposed on data internal to the system. Included shall be requirements, if any, on databases and data files to be included in the system. If all decisions about internal data are left to the design or to requirements specifications for system components, this fact shall be so stated. If such requirements are to be imposed, paragraphs 3.3.x.c and 3.3.x.d of this DID provide a list of topics to be considered.

3.6 Adaptation requirements. This paragraph shall specify the requirements, if any, concerning installation-dependent data that the system is required to provide (such as site-dependent parameters) and operational parameters that the system is required to use that may vary according to operational needs (such as data recording or airport configuration data).

3.7 Safety requirements. This paragraph shall specify the system requirements, if any, concerned with preventing or minimizing unintended hazards to personnel, property, and the physical environment. Examples include restricting the use of dangerous materials; abort/escape provisions from enclosures; gas detection and warning devices; grounding of electrical systems and decontamination.

3.8 Security and privacy requirements. This paragraph shall specify the system requirements, if any, concerned with maintaining security and privacy. The requirements shall include, as applicable, the security/privacy environment in which the system must operate, the type and degree of security or privacy to be provided, the security/privacy risks the system must withstand, required safeguards to reduce those risks, the security/privacy policy that must be met, the security/privacy accountability the system must provide, and the criteria that must be met for security/privacy certification/accreditation.

3.9 System environment requirements. This paragraph shall specify the requirements, if any, regarding the environment in which the system must operate. Examples for a software system are the computer hardware and operating system on which the software must run. (Additional requirements concerning computer resources are given in the next paragraph). Examples for a hardware-software system include the environmental conditions that the system must withstand during transportation, storage, and operation, such as conditions in the natural environment (wind, rain, temperature, geographic location), the induced environment (motion, shock, noise, electromagnetic radiation), and environments due to terrorist action (explosions, computer system compromise).

3.10 Computer resource requirements. This paragraph shall be divided into the following subparagraphs. Depending upon the nature of the system, the computer resources covered in these subparagraphs may constitute the environment of the system (as for a software system) or components of the system (as for a hardware-software system).

3.10.1 Computer hardware requirements. This paragraph shall specify the requirements, if any, regarding computer hardware that must be used by, or incorporated into, the system. The requirements shall include, as applicable, number of each type of equipment, type, size, capacity, and other required characteristics of processors, memory, input/output devices, auxiliary storage, communications/network equipment, and other required equipment.

PREPARATION INSTRUCTIONS – 10.2 Content requirements (continued)

3.10.2 Computer hardware resource utilization requirements. This paragraph shall specify the requirements, if any, on the system's computer hardware resource utilization, such as maximum allowable use of processor capacity, memory capacity, input/output device capacity, auxiliary storage device capacity, and communications/network equipment capacity. The requirements (stated, for example, as percentages of the capacity of each computer hardware resource) shall include the conditions, if any, under which the resource utilization is to be measured.

3.10.3 Computer software requirements. This paragraph shall specify the requirements, if any, regarding computer software that must be used by, or incorporated into, the system. Examples include operating systems, database management systems, communications/ network software, utility software, input and equipment simulators, test software, and manufacturing software. The correct nomenclature, version, and documentation references of each such software item shall be provided.

3.10.4 Computer communications requirements. This paragraph shall specify the additional requirements, if any, concerning the computer communications that must be used by, or incorporated into, the system. Examples include geographic locations to be linked; configuration and network topology; transmission techniques; data transfer rates; gateways; required system use times; type and volume of data to be transmitted/received; time boundaries for transmission/reception/response; peak volumes of data; and diagnostic features.

3.11 System quality factors. This paragraph shall specify the requirements, if any, pertaining to system quality factors. Examples include quantitative requirements concerning system functionality (the ability to perform all required functions), reliability (the ability to perform with correct, consistent results -- such as mean time between failure for equipment), maintainability (the ability to be easily serviced, repaired, or corrected), availability (the ability to be accessed and operated when needed), flexibility (the ability to be easily adapted to changing requirements), portability of software (the ability to be easily modified for a new environment), reusability (the ability to be used in multiple applications), testability (the ability to be easily and thoroughly tested), usability (the ability to be easily learned and used), and other attributes.

3.12 Design and construction constraints. This paragraph shall specify the requirements, if any, that constrain the design and construction of the system. For hardware-software systems, this paragraph shall include the physical requirements imposed on the system. These requirements may be specified by reference to appropriate commercial or FAA standards and specifications. Examples include requirements concerning:

a. Use of a particular system architecture or requirements on the architecture, such as required subsystems; use of standard, FAA, or existing components; or use of Government/acquirer-furnished property (equipment, information, or software)

b. Use of particular design or construction standards; use of particular data standards; use of a particular programming language; workmanship requirements and production techniques

PREPARATION INSTRUCTIONS – 10.2 Content requirements (continued)

c. Physical characteristics of the system (such as weight limits, dimensional limits, color, protective coatings); interchangeability of parts; ability to be transported from one location to another; ability to be carried or set up by one, or a given number of, persons

d. Materials that can and cannot be used; requirements on the handling of toxic materials; limits on the electromagnetic radiation that the system is permitted to generate

e. Use of nameplates, part marking, serial and lot number marking, and other identifying markings

f. Flexibility and expandability that must be provided to support anticipated areas of growth or changes in technology, threat, or mission

3.13 Personnel-related requirements. This paragraph shall specify the system requirements, if any, included to accommodate the number, skill levels, duty cycles, training needs, or other information about the personnel who will use or support the system. Examples include requirements for the number of work stations to be provided and for built-in help and training features. Also included shall be the human factors engineering requirements, if any, imposed on the system. These requirements shall include, as applicable, considerations for the capabilities and limitations of humans, foreseeable human errors under both normal and extreme conditions, and specific areas where the effects of human error would be particularly serious. Examples include requirements for adjustable-height work stations, color and duration of error messages, physical placement of critical indicators or buttons, and use of auditory signals.

3.14 Training-related requirements. This paragraph shall specify the system requirements, if any, pertaining to training. Examples include training devices and training materials to be included in the system.

3.15 Logistics-related requirements. This paragraph shall specify the system requirements, if any, concerned with logistics considerations. These considerations may include: system maintenance, software support, system transportation modes, supply-system requirements, impact on existing facilities, and impact on existing equipment.

3.16 Other requirements. This paragraph shall specify additional system requirements, if any, not covered in the previous paragraphs. Examples include requirements for system documentation, such as specifications, drawings, technical manuals, test plans and procedures, and installation instruction data, if not covered in other contractual documents.

3.17 Packaging requirements. This section shall specify the requirements, if any, for packaging, labeling, and handling the system and its components for delivery. Applicable military specifications and standards may be referenced if appropriate.

3.18 Precedence and criticality of requirements. This paragraph shall specify, if applicable, the order of precedence, criticality, or assigned weights indicating the relative importance of the requirements in this specification. Examples include identifying those requirements deemed critical to safety, to security, or to privacy for purposes of singling them out for special treatment. If all requirements have equal weight, this paragraph shall so state.

PREPARATION INSTRUCTIONS – 10.2 Content requirements (continued)

4. Qualification provisions. This section shall define a set of qualification methods and shall specify for each requirement in Section 3 the method(s) to be used to ensure that the requirement has been met. A table may be used to present this information, or each requirement in Section 3 may be annotated with the method(s) to be used. Qualification methods may include:

a. Demonstration: The operation of the system, or a part of the system, that relies on observable functional operation not requiring the use of instrumentation, special test equipment, or subsequent analysis.

b. Test: The operation of the system, or a part of the system, using instrumentation or other special test equipment to collect data for later analysis.

c. Analysis: The processing of accumulated data obtained from other qualification methods. Examples are reduction, interpolation, or extrapolation of test results.

d. Inspection: The visual examination of system components, documentation, etc.

e. Special qualification methods. Any special qualification methods for the system, such as special tools, techniques, procedures, facilities, acceptance limits, use of standard samples, preproduction or periodic production samples, pilot models, or pilot lots.

5. Requirements traceability. For system-level specifications, this paragraph does not apply. For subsystem-level specifications, this paragraph shall contain:

a. Traceability from each subsystem requirement in this specification to the system requirements it addresses. (Alternatively, this traceability may be provided by annotating each requirement in Section 3.)

Note: Each level of system refinement may result in requirements not directly traceable to higher-level requirements. For example, a system architectural design that creates two subsystems may result in requirements about how the subsystems will interface, even though these interfaces are not covered in system requirements. Such requirements may be traced to a general requirement such as "system implementation" or to the system design decisions that resulted in their generation.

b. Traceability from each system requirement that has been allocated to the subsystem covered by this specification to the subsystem requirements that address it. All system requirements allocated to the subsystem shall be accounted for. Those that trace to subsystem requirements contained in IRSs shall reference those IRSs.

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall contain an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

PREPARATION INSTRUCTIONS – 10.2 Content requirements (continued)

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SYSTEM/SUBSYSTEM DESIGN DESCRIPTION (SSDD)	**DID-FAA-026-06**

3. DESCRIPTION/PURPOSE

3.1 The System/Subsystem Design Description (SSDD) describes the system- or subsystem-wide design as described in Block 7 below.

3.2 The SSDD, with its associated IDDs and DBDDs, is used as the basis for further system development. Throughout this DID, the term "system" may be interpreted to mean "subsystem" as applicable. The resulting document should be titled System Design Description or Subsystem Design Description (SSDD).

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked define and record the design of a system or subsystem.

7.3 Design pertaining to interfaces may be presented in the SSDD or in IDDs. Design pertaining to databases may be presented in the SSDD or in DBDDs.

7.4 The Contract Data Requirements List (CDRL form DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	**FAA-STD-026**	N/A

1. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system to which this document applies. It shall describe the general nature of the system; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. System-wide design decisions. This section shall be divided into paragraphs as needed to present system-wide design decisions, that is, decisions about the system's behavioral design (how it will behave, from a user's point of view, in meeting its requirements, ignoring internal implementation) and other decisions affecting the selection and design of system components. If all such decisions are explicit in the requirements or are deferred to the design of the system components, this section shall so state. Design decisions that respond to requirements designated critical, such as those for safety, security, human factors or privacy, shall be placed in separate subparagraphs. If a design decision depends upon system states or modes, this dependency shall be indicated. Design conventions needed to understand the design shall be presented or referenced. Examples of system-wide design decisions are the following:

a. Design decisions regarding inputs the system will accept and outputs it will produce, including interfaces with other systems, configuration items, and users (4.3.x of this DID identifies topics to be considered in this description). If part or all of this information is given in Interface Design Descriptions (IDDs), they may be referenced.

b. Design decisions on system behavior in response to each input or condition, including actions the system will perform, response times and other performance characteristics, description of physical systems modeled, selected equations/algorithms/ rules, and handling of unallowed inputs or conditions.

c. Design decisions on how system databases/data files will appear to the user (4.3.x of this DID identifies topics to be considered in this description). If part or all of this information is given in Database Design Descriptions (DBDDs), they may be referenced.

d. Selected approach to meeting safety, security, human factors and privacy requirements.

e. Design and construction choices for hardware or hardware-software systems, such as physical size, color, shape, weight, materials, and markings.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

f. Other system-wide design decisions made in response to requirements, such as selected approach to providing required flexibility, availability, and maintainability.

4. System architectural design. This section shall be divided into the following paragraphs to describe the system architectural design. If part or all of the design depends upon system states or modes, this dependency shall be indicated. If design information falls into more than one paragraph, it may be presented once and referenced from the other paragraphs. Design conventions needed to understand the design shall be presented or referenced. This section shall include a description of applicable operating system and application layer software.

Note: For brevity, this section is written in terms of organizing a system directly into Hardware Configuration Items (HWCIs), Software Configuration Items (SCIs), and manual operations, but should be interpreted to cover organizing a system into subsystems, organizing a subsystem into HWCIs, SCIs, and manual operations, or other variations as appropriate.

4.1 System components. This paragraph shall:

a. Identify the components of the system (HWCIs, SCIs, and manual operations). Include rationale for allocation of components. Each component shall be assigned a project-unique identifier. Note: a database may be treated as a SCI or as part of a SCI.

b. Show the static (such as "consists of") relationship(s) of the components. Multiple relationships may be presented, depending on the selected design methodology.

c. State the purpose of each component and identify the system requirements and system-wide design decisions allocated to it. (Alternatively, the allocation of requirements may be provided in 5.a.)

d. Identify each component's development status/type, if known (such as new development, existing component to be reused as is, existing design to be reused as is, existing design or component to be reengineered, component to be developed for reuse, component planned for Build N, etc.) For existing design or components, the description shall provide identifying information, such as name, version, documentation references, location, etc.

e. For each computer system or other aggregate of computer hardware resources identified for use in the system, describe its computer hardware resources (such as processors, memory, input/output devices, auxiliary storage, and communications/ network equipment). Each description shall, as applicable, identify the configuration items that will use the resource, describe the allocation of resource utilization to each CSCI that will use the resource (for example, 20% of the resource's capacity allocated to SCI 1, 30% toSCI 2), describe the conditions under which utilization will be measured, and describe the characteristics of the resource:

1) Descriptions of computer processors shall include, as applicable, manufacturer name and model number, processor speed/capacity, identification of instruction set architecture, applicable compiler(s), word size (number of bits in each computer word), character set standard (such as ASCII, EBCDIC), and interrupt capabilities.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

2) Descriptions of memory shall include, as applicable, manufacturer name and model number and memory size, type, speed, and configuration (such as 256K cache memory, 16MB RAM (4MB x 4)).

3) Descriptions of input/output devices shall include, as applicable, manufacturer name and model number, type of device, and device speed/capacity.

4) Descriptions of auxiliary storage shall include, as applicable, manufacturer name and model number, type of storage, amount of installed storage, and storage speed.

5) Descriptions of communications/network equipment, such as modems, network interface cards, hubs, gateways, cabling, high speed data lines, or aggregates of these or other components, shall include, as applicable, manufacturer name and model number, data transfer rates/capacities, network topologies, transmission techniques, and protocols used.

6) Each description shall also include, as applicable, growth capabilities, diagnostic capabilities, and any additional hardware capabilities relevant to the description.

f. Present a specification tree for the system, that is, a diagram that identifies and shows the relationships among the planned specifications for the system components.

4.2 Concept of execution. This paragraph shall describe the concept of execution among the system components. It shall include diagrams and descriptions showing the dynamic relationship of the components; that is, how they will interact during system operation, including, as applicable, flow of execution control, data flow, operating system and application layer software features, dynamically controlled sequencing, state transition diagrams, timing diagrams, priorities among components, handling of interrupts, timing/sequencing relationships, exception handling, concurrent execution, dynamic allocation/de-allocation, dynamic creation/deletion of objects, processes, tasks, and other aspects of dynamic behavior.

4.3 Interface design. This paragraph shall be divided into the following subparagraphs to describe the interface characteristics of the system components. It shall include both interfaces among the components and their interfaces with external entities such as other systems, configuration items, and users. Note: There is no requirement for these interfaces to be completely designed at this level; this paragraph is provided to allow the recording of interface design decisions made as part of system architectural design. If part or all of this information is contained in Interface Design Descriptions (IDDs) or elsewhere, these sources may be referenced.

4.3.1 Interface identification and diagrams. This paragraph shall state the project-unique identifier assigned to each interface and shall identify the interfacing entities (systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided, as appropriate, to depict the interfaces.

4.3.x (Project-unique identifier of interface). This paragraph (beginning with 4.3.2) shall identify an interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

subparagraphs as needed to describe the interface characteristics of one or both of the interfacing entities. If a given interfacing entity is not covered by this SSDD (for example, an external system) but its interface characteristics need to be mentioned to describe interfacing entities that are, these characteristics shall be stated as assumptions or as "When [the entity not covered] does this, [the entity that is covered] will …." This paragraph may reference other documents (such as data dictionaries, standards for protocols, and standards for user interfaces) in place of stating the information here. The design description shall include the following, as applicable, presented in any order suited to the information to be provided, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority assigned to the interface by the interfacing entity(ies)

b. Type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

c. Characteristics of individual data elements that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., variable or field name in code or database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)

d. Characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier to be used for traceability
        b) Non-technical (natural language) name
        c) Technical name (e.g., record or data structure name in code or database)
        d) Abbreviations or synonymous names
    2) Data elements in the assembly and their structure (number, order, grouping)

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3) Medium (such as disk) and structure of data elements/assemblies on the medium
4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
5) Relationships among assemblies, such as sorting/access characteristics
6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
7) Security and privacy constraints
8) Sources (setting/sending entities) and recipients (using/receiving entities)

e. Characteristics of communication methods that the interfacing entity(ies) will use for the interface, such as:
1) Project-unique identifier(s)
2) Communication links/bands/frequencies/media and their characteristics
3) Message formatting
4) Flow control (such as sequence numbering and buffer allocation)
5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
6) Routing, addressing, and naming conventions
7) Transmission services, including priority and grade
8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Characteristics of protocols that the interfacing entity(ies) will use for the interface, such as:
1) Project-unique identifier(s)
2) Priority/layer of the protocol
3) Packeting, including fragmentation and reassembly, routing, and addressing
4) Legality checks, error control, and recovery procedures
5) Synchronization, including connection establishment, maintenance, termination
6) Status, identification, and any other reporting features

g. Other characteristics, such as physical compatibility of the interfacing entity(ies) (dimensions, tolerances, loads, voltages, plug compatibility, etc.)

5. Requirements traceability. This paragraph shall contain:

a. Traceability from each system component identified in this SSDD to the system requirements allocated to it. (Alternatively, this traceability may be provided in 4.1.)

b. Traceability from each system requirement to the system components to which it is allocated.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall contain an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE REQUIREMENTS SPECIFICATION (SRS)	DID-FAA-STD-026-07

3. DESCRIPTION/PURPOSE

3.1 The Software Requirements Specification (SRS) specifies the requirements for a Software Configuration Item (SCI) and the methods to be used to ensure that each requirement has been met. Requirements pertaining to the SCI's external interfaces may be presented in the SRS or in one or more Interface Requirements Specifications (IRSs) (DID-FAA-STD-026-08) referenced from the SRS.

3.2 The SRS, possibly supplemented by IRSs, is used as the basis for design and qualification testing of a SCI.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the software requirements to be met by a CSCI.

7.3 Requirements pertaining to CSCI interfaces may be presented in the SRS or in IRSs.

7.4 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
None	N/A	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support organizations; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this specification. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Requirements. This section shall be divided into the following paragraphs to specify the SCI requirements, that is, those characteristics of the SCI that are conditions for its acceptance. SCI requirements are software requirements generated to satisfy the system requirements allocated to this SCI. Each requirement shall be assigned a project-unique identifier to support testing and traceability and shall be stated in such a way that an objective test can be defined for it. Each requirement shall be annotated with associated qualification method(s) (see section 4) and traceability to system (or subsystem, if applicable) requirements (see section 5.a) if not provided in those sections. The degree of detail to be provided shall be guided by the following rule: Include those characteristics of the SCI that are conditions for SCI acceptance; defer to design descriptions those characteristics that the acquirer is willing to leave up to the developer. If there are no requirements in a given paragraph, the paragraph shall so state. If a given requirement fits into more than one paragraph, it may be stated once and referenced from the other paragraphs.

3.1 Required states and modes. If the SCI is required to operate in more than one state or mode having requirements distinct from other states or modes, this paragraph shall identify and define each state and mode. Examples of states and modes include: idle, ready, active, post-use analysis, training, degraded, emergency, backup, etc. The distinction between states and modes is arbitrary. A SCI may be described in terms of states only, modes only, states within modes, modes within states, or any other scheme that is useful. If no states or modes are required, this paragraph shall so state, without the need to create artificial distinctions. If states and/or modes are required, each requirement or group of requirements in this specification shall be correlated to the states and modes. The correlation may be indicated by a table or other method in this paragraph, in an appendix referenced from this paragraph, or by annotation of the requirements in the paragraphs where they appear.

3.2 SCI capability requirements. This paragraph shall be divided into subparagraphs to itemize the requirements associated with each capability of the SCI. A "capability" is defined as a group of related requirements. The word "capability" may be replaced with "function," "subject," "object," or other term useful for presenting the requirements.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3.2.x (SCI capability). This paragraph shall identify a required SCI capability and shall itemize the requirements associated with the capability. If the capability can be more clearly specified by dividing it into constituent capabilities, the constituent capabilities shall be specified in subparagraphs. The requirements shall specify required behavior of the SCI and shall include applicable parameters, such as response times, throughput times, other timing constraints, sequencing, accuracy, capacities (how much/how many), priorities, continuous operation requirements, and allowable deviations based on operating conditions. The requirements shall include, as applicable, required behavior under unexpected, unallowed, or "out of bounds" conditions, requirements for error handling, and any provisions to be incorporated into the SCI to provide continuity of operations in the event of emergencies. Paragraph 3.3.x of this DID provides a list of topics to be considered when specifying requirements regarding inputs the SCI must accept and outputs it must produce.

3.3 SCI external interface requirements. This paragraph shall be divided into subparagraphs to specify the requirements, if any, for the SCI's external interfaces. This paragraph may reference one or more Interface Requirements Specifications (IRSs) or other documents containing these requirements.

3.3.1 Interface identification and diagrams. This paragraph shall identify the required external interfaces of the SCI (that is, relationships with other entities that involve sharing, providing or exchanging data). The identification of each interface shall include a project-unique identifier and shall designate the interfacing entities (systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided to depict the interfaces.

3.3.x (Project-unique identifier of interface). This paragraph (beginning with 3.3.2) shall identify a SCI external interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into subparagraphs as needed to state the requirements imposed on the SCI to achieve the interface. Interface characteristics of the other entities involved in the interface shall be stated as assumptions or as "When [the entity not covered] does this, the SCI shall...," not as requirements on the other entities. This paragraph may reference other documents (such as data dictionaries, standards for communication protocols, and standards for user interfaces) in place of stating the information here. The requirements shall include the following, as applicable, presented in any order suited to the requirements, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority that the SCI must assign the interface

b. Requirements on the type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

c. Required characteristics of individual data elements that the SCI must provide, store, send, access, receive, etc., such as:
   1) Names/identifiers
      a) Project-unique identifier
      b) Non-technical (natural-language) name
      c) Data element name
      d) Technical name (e.g., variable or field name in code or database)
      e) Abbreviation or synonymous names
   2) Data type (alphanumeric, integer, etc.)
   3) Size and format (such as length and punctuation of a character string)
   4) Units of measurement (such as meters, dollars, nanoseconds)
   5) Range or enumeration of possible values (such as 0-99)
   6) Accuracy (how correct) and precision (number of significant digits)
   7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
   8) Security and privacy constraints
   9) Sources (setting/sending entities) and recipients (using/receiving entities)

d. Required characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the SCI must provide, store, send, access, receive, etc., such as:
   1) Names/identifiers
      a) Project-unique identifier
      b) Non-technical (natural language) name
      c) Technical name (e.g., record or data structure name in code or database)
      d) Abbreviations or synonymous names
   2) Data elements in the assembly and their structure (number, order, grouping)
   3) Medium (such as disk) and structure of data elements/assemblies on the medium
   4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
   5) Relationships among assemblies, such as sorting/access characteristics
   6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
   7) Security and privacy constraints
   8) Sources (setting/sending entities) and recipients (using/receiving entities)

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

e. Required characteristics of communication methods that the SCI must use for the interface, such as:
   1) Project-unique identifier(s)
   2) Communication links/bands/frequencies/media and their characteristics
   3) Message formatting
   4) Flow control (such as sequence numbering and buffer allocation)
   5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
   6) Routing, addressing, and naming conventions
   7) Transmission services, including priority and grade
   8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Required characteristics of protocols the SCI must use for the interface, such as:
   1) Project-unique identifier(s)
   2) Priority/layer of the protocol
   3) Packeting, including fragmentation and reassembly, routing, and addressing
   4) Legality checks, error control, and recovery procedures
   5) Synchronization, including connection establishment, maintenance, termination
   6) Status, identification, and any other reporting features

g. Other required characteristics, such as physical compatibility of the interfacing entities (dimensions, tolerances, loads, plug compatibility, etc.), voltages, etc.

3.4 SCI internal interface requirements. This paragraph shall specify the requirements, if any, imposed on interfaces internal to the SCI. If all internal interfaces are left to the design, this fact shall be so stated. If such requirements are to be imposed, paragraph 3.3 of this DID provides a list of topics to be considered.

3.5 SCI internal data requirements. This paragraph shall specify the requirements, if any, imposed on data internal to the SCI. Included shall be requirements, if any, on databases and data files to be included in the SCI. If all decisions about internal data are left to the design, this fact shall be so stated. If such requirements are to be imposed, paragraphs 3.3.x.c and 3.3.x.d of this DID provide a list of topics to be considered.

3.6 Adaptation requirements. This paragraph shall specify the requirements, if any, concerning installation-dependent data to be provided by the SCI (such as site-dependent parameters) and operational parameters that the SCI is required to use that may vary according to operational needs (such as data recording or airport configuration data).

3.7 Safety requirements. This paragraph shall specify the SCI requirements, if any, concerned with preventing or minimizing unintended hazards to personnel, property, and the physical environment. Examples include safeguards the SCI must provide to prevent inadvertent actions and non-actions.

3.8 Security and privacy requirements. This paragraph shall specify the SCI requirements, if any, concerned with maintaining security and privacy. These requirements shall include, as applicable, the security/privacy environment in which the SCI must operate, the type and degree of security or privacy to be provided, the security/privacy risks the SCI must withstand, required safeguards to reduce those risks, the security/privacy policy that must be met, the security/privacy accountability the SCI must provide, and the criteria that must be met for security/privacy certification/accreditation.

3.9 SCI environment requirements. This paragraph shall specify the requirements, if any, regarding the environment in which the SCI must operate. Examples include the computer hardware and operating system on which the SCI must run. (Additional requirements concerning computer resources are given in the next paragraph.)

3.10 Computer resource requirements. This paragraph shall be divided into the following subparagraphs.

3.10.1 Computer hardware requirements. This paragraph shall specify the requirements, if any, regarding computer hardware that must be used by the SCI. The requirements shall include, as applicable, number of each type of equipment, type, size, capacity, and other required characteristics of processors, memory, input/output devices, auxiliary storage, communications/network equipment, and other required equipment.

3.10.2 Computer hardware resource utilization requirements. This paragraph shall specify the requirements, if any, on the SCI's computer hardware resource utilization, such as maximum allowable use of processor capacity, memory capacity, input/output device capacity, auxiliary storage device capacity, and communications/network equipment capacity. The requirements (stated, for example, as percentages of the capacity of each computer hardware resource) shall include the conditions, if any, under which the resource utilization is to be measured.

3.10.3 Computer software requirements. This paragraph shall specify the requirements, if any, regarding computer software that must be used by, or incorporated into, the SCI. Examples include operating systems, database management systems, communications/ network software, utility software, input and equipment simulators, test software, and manufacturing software. The correct nomenclature, version, and documentation references of each such software item shall be provided.

3.10.4 Computer communications requirements. This paragraph shall specify the additional requirements, if any, concerning the computer communications that must be used by the SCI. Examples include geographic locations to be linked; configuration and network topology; transmission techniques; data transfer rates; gateways; required system use times; type and volume of data to be transmitted/received; time boundaries for transmission/ reception/response; peak volumes of data; and diagnostic features.

3.11 Software quality factors. This paragraph shall specify the SCI requirements, if any, concerned with software quality factors identified in the contract or derived from a higher level specification. Examples include quantitative requirements regarding SCI functionality (the ability to perform all required functions), reliability (the ability to perform with correct, consistent results),

maintainability (the ability to be easily corrected), availability (the ability to be accessed and operated when needed), flexibility (the ability to be easily adapted to changing requirements), portability (the ability to be easily modified for a new environment), reusability (the ability to be used in multiple applications), testability (the ability to be easily and thoroughly tested), usability (the ability to be easily learned and used), and other attributes.

3.12 Design and implementation constraints. This paragraph shall specify the requirements, if any, that constrain the design and implementation of the SCI. These requirements may be specified by reference to appropriate commercial or military standards and specifications. Examples include requirements concerning:

a. Use of a particular SCI architecture or requirements on the architecture, such as required databases or other software units; use of standard, military, or existing components; or use of Government-furnished property (equipment, information, or software)

b. Use of particular design or implementation standards; use of particular data standards; use of a particular programming language

c. Flexibility and expandability that must be provided to support anticipated areas of growth or changes in technology or mission

3.13 Personnel-related requirements. This paragraph shall specify the SCI requirements, if any, included to accommodate the number, skill levels, duty cycles, training needs, or other information about the personnel who will use or support the SCI. Examples include requirements for number of simultaneous users and for built-in help or training features. Also included shall be the human factors engineering requirements, if any, imposed on the SCI. These requirements shall include, as applicable, considerations for the capabilities and limitations of humans; foreseeable human errors under both normal and extreme conditions; and specific areas where the effects of human error would be particularly serious. Examples include requirements for color and duration of error messages, physical placement of critical indicators or keys, and use of auditory signals.

3.14 Training-related requirements. This paragraph shall specify the SCI requirements, if any, pertaining to training. Examples include training software to be included in the SCI.

3.15 Logistics-related requirements. This paragraph shall specify the SCI requirements, if any, concerned with logistics considerations. These considerations may include: system maintenance, software support, system transportation modes, supply-system requirements, impact on existing facilities, and impact on existing equipment.

3.16 Other requirements. This paragraph shall specify additional SCI requirements, if any, not covered in the previous paragraphs.

3.17 Packaging requirements. This section shall specify the requirements, if any, for packaging, labeling, and handling the SCI for delivery (for example, delivery on magnetic media labeled and packaged in a certain way). Applicable standards may be referenced if appropriate.

3.18 Precedence and criticality of requirements. This paragraph shall specify, if applicable, the order of precedence, criticality, or assigned weights indicating the relative importance of the requirements in this specification. Examples include identifying those requirements deemed critical to safety, security, performance, or human factors, for purposes of singling them out for special treatment. If all requirements have equal weight, this paragraph shall so state.

4. Qualification provisions. This section shall define a set of qualification methods and shall specify for each requirement in Section 3 the method(s) to be used to ensure that the requirement has been met. A table may be used to present this information, or each requirement in Section 3 may be annotated with the method(s) to be used. Qualification methods may include:

a. Demonstration: The operation of the SCI, or a part of the SCI, that relies on observable functional operation not requiring the use of instrumentation, special test equipment, or subsequent analysis.

b. Test: The operation of the SCI, or a part of the SCI, using instrumentation or other special test equipment to collect data for later analysis.

c. Analysis: The processing of accumulated data obtained from other qualification methods. Examples are reduction, interpretation, or extrapolation of test results.

d. Inspection: The visual examination of SCI code, documentation, etc.

e. Special qualification methods: Any special qualification methods for the SCI, such as special tools, techniques, procedures, facilities, and acceptance limits.

5. Requirements traceability. This paragraph shall contain:

a. Traceability from each SCI requirement in this specification to the system (or subsystem, if applicable) requirements it addresses. (Alternatively, this traceability may be provided by annotating each requirement in Section 3.)

Note: Each level of system refinement may result in requirements not directly traceable to higher-level requirements. For example, a system architectural design that creates multiple SCIs may result in requirements about how the SCIs will interface, even though these interfaces are not covered in system requirements. Such requirements may be traced to a general requirement such as "system implementation" or to the system design decisions that resulted in their generation.

b. Traceability from each system (or subsystem, if applicable) requirement allocated to this SCI to the SCI requirements that address it. All system (subsystem) requirements allocated to this SCI shall be accounted for. Those that trace to SCI requirements contained in IRSs shall reference those IRSs.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

6. Notes. This section shall contain any general information that aids in understanding this specification (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
INTERFACE REQUIREMENTS SPECIFICATION (IRS)	DID-FAA-026-08

3. DESCRIPTION/PURPOSE

3.1 The Interface Requirements Specification (IRS) specifies the requirements imposed on one or more systems, subsystems, Hardware Configuration Items (HWCIs), Software Configuration Items (SCIs), manual operations, or other system components to achieve one or more interfaces among these entities. An IRS can cover any number of interfaces.

3.2 The IRS can be used to supplement the System/Subsystem Specification (SSS) (DID-FAA-026-05) and Software Requirements Specification (SRS) (DID-FAA-026-07) as the basis for design and qualification testing of systems and SCIs.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the interface requirements for one or more systems, subsystem, HWCIs, SCIs, manual operations, or other system components.

7.3 The IRS can be used to supplement the SSS and the SRS.

7.4 The Contract Data Requirements List (CDRL DD Form 1423, or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
NONE	**FAA-STD-026**	**N/A**

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the systems, subsystems, or items to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the systems, the interfacing entities, and the interfaces to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system(s) and software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this specification. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Requirements. This section shall be divided into the following paragraphs to specify the requirements imposed on one or more systems, subsystems, configuration items, manual operations, or other system components to achieve one or more interfaces among these entities. Each requirement shall be assigned a project-unique identifier to support testing and traceability and shall be stated in such a way that an objective test can be defined for it. Each requirement shall be annotated with associated qualification method(s) (see section 4) and traceability to system (or subsystem, if applicable) requirements (see section 5.a) if not provided in those sections. The degree of detail to be provided shall be guided by the following rule: Include those characteristics of the interfacing entities that are conditions for their acceptance; defer to design descriptions those characteristics that the acquirer is willing to leave up to the developer. If a given requirement fits into more than one paragraph, it may be stated once and referenced from the other paragraphs. If an interfacing entity included in this specification will operate in states and/or modes having interface requirements different from other states and modes, each requirement or group of requirements for that entity shall be correlated to the states and modes. The correlation may be indicated by a table or other method in this paragraph, in an appendix referenced from this paragraph, or by annotation of the requirements in the paragraphs where they appear.

3.1 Interface identification and diagrams. For each interface identified in 1.1, this paragraph shall include a project-unique identifier and shall designate the interfacing entities (systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided to depict the interfaces.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3.x (Project-unique identifier of interface). This paragraph (beginning with 3.2) shall identify an interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into subparagraphs as needed to state the requirements imposed on one or more of the interfacing entities to achieve the interface. If the interface characteristics of an entity are not covered by this IRS but need to be mentioned to specify the requirements for entities that are, those characteristics shall be stated as assumptions or as "When [the entity not covered] does this, the [entity being specified] shall...," rather than as requirements on the entities not covered by this IRS. This paragraph may reference other documents (such as data dictionaries, standards for communication protocols, and standards for user interfaces) in place of stating the information here. The requirements shall include the following, as applicable, presented in any order suited to the requirements, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority that the interfacing entity(ies) must assign the interface
b. Requirements on the type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented
c. Required characteristics of individual data elements that the interfacing entity(ies) must provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., variable or field name in code or database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)
d. Required characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the interfacing entity(ies) must provide, store, send, access, receive, etc., such as:

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1) Names/identifiers
   a) Project-unique identifier
   b) Non-technical (natural language) name
   c) Technical name (e.g., record or data structure name in code or database)
   d) Abbreviations or synonymous names
2) Data elements in the assembly and their structure (number, order, grouping)
3) Medium (such as disk) and structure of data elements/assemblies on the medium
4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
5) Relationships among assemblies, such as sorting/access characteristics
6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
7) Security and privacy constraints
8) Sources (setting/sending entities) and recipients (using/receiving entities)

e. Required characteristics of communication methods that the interfacing entity(ies) must use for the interface, such as:
   1) Project-unique identifier(s)
   2) Communication links/bands/frequencies/media and their characteristics
   3) Message formatting
   4) Flow control (such as sequence numbering and buffer allocation)
   5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
   6) Routing, addressing, and naming conventions
   7) Transmission services, including priority and grade
   8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Required characteristics of protocols the interfacing entity(ies) must use for the interface, such as:
   1) Project-unique identifier(s)
   2) Priority/layer of the protocol
   3) Packeting, including fragmentation and reassembly, routing, and addressing
   4) Legality checks, error control, and recovery procedures
   5) Synchronization, including connection establishment, maintenance, termination
   6) Status, identification, and any other reporting features

g. Other required characteristics, such as physical compatibility of the interfacing entity(ies) (dimensions, tolerances, loads, voltages, plug compatibility, etc.) or types and handling of errors that are not specified in the software requirements.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3.y Precedence and criticality of requirements. This paragraph shall be numbered as the last paragraph in Section 3 and shall specify, if applicable, the order of precedence, criticality, or assigned weights indicating the relative importance of the requirements in this specification. Examples include identifying those requirements deemed critical to safety, to security, or to privacy for purposes of singling them out for special treatment. If all requirements have equal weight, this paragraph shall so state.

4. Qualification provisions. This section shall define a set of qualification methods and shall specify, for each requirement in Section 3, the qualification method(s) to be used to ensure that the requirement has been met. A table may be used to present this information, or each requirement in Section 3 may be annotated with the method(s) to be used. Qualification methods may include:

a. Demonstration: The operation of interfacing entities that relies on observable functional operation not requiring the use of instrumentation, special test equipment, or subsequent analysis.

b. Test: The operation of interfacing entities using instrumentation or special test equipment to collect data for later analysis.

c. Analysis: The processing of accumulated data obtained from other qualification methods. Examples are reduction, interpretation, or extrapolation of test results.

d. Inspection: The visual examination of interfacing entities, documentation, etc.

e. Special qualification methods: Any special qualification methods for the interfacing entities, such as special tools, techniques, procedures, facilities, and acceptance limits.

5. Requirements traceability. For system-level interfacing entities, this paragraph does not apply. For each subsystem- or lower-level interfacing entity covered by this IRS, this paragraph shall contain:

a. Traceability from each requirement imposed on the entity in this specification to the system (or subsystem, if applicable) requirements it addresses. (Alternatively, this traceability may be provided by annotating each requirement in Section 3.)

Note: Each level of system refinement may result in requirements not directly traceable to higher-level requirements. For example, a system architectural design that creates multiple SCIs may result in requirements about how the SCIs will interface, even though these interfaces are not covered in system requirements. Such requirements may be traced to a general requirement such as "system implementation" or to the system design decisions that resulted in their generation.

b. Traceability from each system (or subsystem, if applicable) requirement that has been allocated to the interfacing entity and that affects an interface covered in this

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

specification to the requirements in this specification that address it.

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE DESIGN DESCRIPTION (SDD)	**DID-FAA-026-09**

3. DESCRIPTION/PURPOSE

3.1 The Software Design Description (SDD) describes the design of a Software Configuration Item (SCI). It describes the SCI-wide design decisions, the SCI architectural design, and the detailed design needed to implement the software. The SDD may be supplemented by Interface Design Descriptions (IDDs) (DID-FAA-026-10) and Database Design Descriptions (DBDDs) (DID-FAA-026-11) as described in Block 7 below.

3.2 The SDD, with its associated IDDs and DBDDs, is used as the basis for implementing the software. It provides the acquirer visibility into the design and provides information needed for software support.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the design of a SCI.

7.3 Design pertaining to interfaces may be presented in the SDD or in IDDs. Design pertaining to databases may be presented in the SDD or in DBDDs.

7.4 The Contract Data Requirements List (CDRL) (DD Form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	**FAA-STD-026**	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier. When data are delivered in the form of a traditional document, the Document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data delivered in an alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. When data are delivered in the form of a traditional document, the document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data delivered in an alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. When data are delivered in the form of a traditional document, each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data delivered in an alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. When data are delivered in the form of a traditional document, paragraphs that have been tailored out of the DID shall result in the corresponding paragraph number and title in the document, followed by "This paragraph has been tailored out." For data delivered in an alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10.2 PREPARATION INSTRUCTIONS -- Content Requirements

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support organizations; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. SCI-wide design decisions. This section shall be divided into paragraphs as needed to present SCI-wide design decisions, that is, decisions about the SCI's behavioral design (how it will behave, from a user's point of view, in meeting its requirements, ignoring internal implementation) and other decisions affecting the selection and design of the software units that make up the SCI. If all such decisions are explicit in the SCI requirements or are deferred to the design of the SCI's software units, this section shall so state. Design decisions that respond to requirements designated critical, such as those for safety, security, human factors or privacy, shall be placed in separate subparagraphs. If a design decision depends upon system states or modes, this dependency shall be indicated. Design conventions needed to understand the design shall be presented or referenced. Examples of SCI-wide design decisions are the following:

a. Design decisions regarding inputs the SCI will accept and outputs it will produce, including interfaces with other systems, HWCIs, SCIs, and users (4.3.x of this DID identifies topics to be considered in this description). If part or all of this information is given in Interface Design Descriptions (IDDs), they may be referenced.

b. Design decisions on SCI behavior in response to each input or condition, including actions the SCI will perform, response times and other performance characteristics, description of physical systems modeled, selected equations/algorithms/rules, and handling of unallowed inputs or conditions.

c. Design decisions on how databases/data files will appear to the user (4.3.x of this DID identifies topics to be considered in this description). If part or all of this information is given in Database Design Descriptions (DBDDs), they may be referenced.

d. Selected approach to meeting safety, security, human factors and privacy requirements.

e. Other SCI-wide design decisions made in response to requirements, such as selected approach to providing required flexibility, availability, and maintainability.

4. SCI architectural design. This section shall be divided into the following paragraphs to describe the SCI architectural design. If part or all of the design depends upon system states or modes, this dependency shall be indicated. If design information falls into more than one paragraph, it may be presented once and referenced from the other paragraphs. Design conventions needed to understand the design shall be presented or referenced.

4.1 SCI components. This paragraph shall:

a. Identify the software units that make up the SCI. Each software unit shall be assigned a project-unique identifier.

Note: A software unit is an element in the design of a SCI; for example, a major subdivision of a SCI, a component of that subdivision, a class, object, module, function, routine, or database. Software units may occur at different levels of a hierarchy and may consist of other software units. Software units in the design may or may not have a one-to-one relationship with the code and data entities (routines, procedures, databases, data files, etc.) that implement them or with the computer files containing those entities. A database may be treated as a SCI or as a software unit. The SDD may refer to software units by any name(s) consistent with the design methodology being used.

b. Show the static (such as "consists of") relationship(s) of the software units. Multiple relationships may be presented, depending on the selected software design methodology (for example, in an object-oriented design, this paragraph may present the class and object structures as well as the module and process architectures of the SCI).

c. State the purpose of each software unit and identify the SCI requirements and SCI-wide design decisions allocated to it. (Alternatively, the allocation of requirements may be provided in 6.a.)

d. Identify each software unit's development status/type (such as new development, existing design or software to be reused as is, existing design or software to be reengineered, software to be developed for reuse, software planned for Build N, etc.) For existing design or software, the description shall provide identifying information, such as name, version, documentation references, library, etc.

e. Describe the SCI's (and as applicable, each software unit's) planned utilization of computer hardware resources (such as processor capacity, memory capacity, input/output device capacity, auxiliary storage capacity, and communications/network equipment capacity). The description shall cover all

f. computer hardware resources included in resource utilization requirements for the SCI, in system-level resource allocations affecting the SCI, and in resource utilization measurement planning in the Software Development Plan. If all utilization data for a given computer hardware resource are presented in a single location, such as in one SDD, this paragraph may reference that source.

Included for each computer hardware resource shall be:

1) The SCI requirements or system-level resource allocations being satisfied

2) The assumptions and conditions on which the utilization data are based (for example, typical usage, worst-case usage, assumption of certain events)

3) Any special considerations affecting the utilization (such as use of virtual memory, overlays, or multiprocessors or the impacts of operating system overhead, library software, or other implementation overhead)

4) The units of measure used (such as percentage of processor capacity, cycles per second, bytes of memory, kilobytes per second)

5) The level(s) at which the estimates or measures will be made (such as software unit, SCI, or executable program)

f. Identify the program library in which the software that implements each software unit is to be placed

4.2 Concept of execution. This paragraph shall describe the concept of execution among the software units. It shall include diagrams and descriptions showing the dynamic relationship of the software units, that is, how they will interact during SCI operation, including, as applicable, flow of execution control, data flow, operating system and application layer software features, dynamically controlled sequencing, state transition diagrams, timing diagrams, priorities among units, handling of interrupts, timing/sequencing relationships, exception handling, concurrent execution, dynamic allocation/deallocation, dynamic creation/deletion of objects, processes, tasks, and other aspects of dynamic behavior.

4.3 Interface design. This paragraph shall be divided into the following subparagraphs to describe the interface characteristics of the software units. It shall include both interfaces among the software units and their interfaces with external entities such as systems, configuration items, and users. If part or all of this information is contained in Interface Design Descriptions (IDDs), in section 5 of the SDD, or elsewhere, these sources may be referenced.

4.3.1 Interface identification and diagrams. This paragraph shall state the project-unique identifier assigned to each interface and shall identify the interfacing entities (software units, systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which

are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided, as appropriate, to depict the interfaces.

4.3.x (Project-unique identifier of interface). This paragraph (beginning with 4.3.2) shall identify an interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into subparagraphs as needed to describe the interface characteristics of one or both of the interfacing entities. If a given interfacing entity is not covered by this SDD (for example, an external system) but its interface characteristics need to be mentioned to describe interfacing entities that are, these characteristics shall be stated as assumptions or as "When [the entity not covered] does this, [the entity that is covered] will …." This paragraph may reference other documents (such as data dictionaries, standards for protocols, and standards for user interfaces) in place of stating the information here. The design description shall include the following, as applicable, presented in any order suited to the information to be provided, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority assigned to the interface by the interfacing entity(ies)

b. Type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

c. Characteristics of individual data elements that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., variable or field name in code or database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)

d. Characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:

1) Names/identifiers
   a) Project-unique identifier
   b) Non-technical (natural language) name
   c) Technical name (e.g., record or data structure name in code or database)
   d) Abbreviations or synonymous names
2) Data elements in the assembly and their structure (number, order, grouping)
3) Medium (such as disk) and structure of data elements/assemblies on the medium
4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
5) Relationships among assemblies, such as sorting/access characteristics
6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
7) Security and privacy constraints
8) Sources (setting/sending entities) and recipients (using/receiving entities)

e. Characteristics of communication methods that the interfacing entity(ies) will use for the interface, such as:

1) Project-unique identifier(s)
2) Communication links/bands/frequencies/media and their characteristics
3) Message formatting
4) Flow control (such as sequence numbering and buffer allocation)
5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
6) Routing, addressing, and naming conventions
7) Transmission services, including priority and grade
8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Characteristics of protocols that the interfacing entity(ies) will use for the interface, such as:

1) Project-unique identifier(s)
2) Priority/layer of the protocol
3) Packeting, including fragmentation and reassembly, routing, and addressing
4) Legality checks, error control, and recovery procedures
5) Synchronization, including connection establishment, maintenance, termination
6) Status, identification, and any other reporting features

g. Other characteristics, such as physical compatibility of the interfacing entity(ies) (dimensions, tolerances, loads, voltages, plug compatibility, etc.)

5. SCI detailed design. This section shall be divided into the following paragraphs to describe each software unit of the SCI. If part of all of the design depends upon system states or modes, this dependency shall be indicated. If design information falls into more

than one paragraph, it may be presented once and referenced from the other paragraphs. Design conventions needed to understand the design shall be presented or referenced. Interface characteristics of software units may be described here, in Section 4, or in Interface Design Descriptions (IDDs). Software units that are databases, or that are used to access or manipulate databases, may be described here or in Database Design Descriptions (DBDDs).

5.x (Project-unique identifier of a software unit, or designator of a group of software units). This paragraph shall identify a software unit by project-unique identifier and shall describe the unit. The description shall include the following information, as applicable. Alternatively, this paragraph may designate a group of software units and identify and describe the software units in subparagraphs. Software units that contain other software units may reference the descriptions of those units rather than repeating information.

a. Unit design decisions, if any, such as algorithms to be used, if not previously selected

b. Any constraints, limitations, or unusual features in the design of the software unit

c. The programming language to be used and rationale for its use if other than the specified SCI language

d. If the software unit consists of or contains procedural commands (such as menu selections in a database management system (DBMS) for defining forms and reports, on-line DBMS queries for database access and manipulation, input to a graphical user interface (GUI) builder for automated code generation, commands to the operating system, or shell scripts), a list of the procedural commands and reference to user manuals or other documents that explain them

e. If the software unit contains, receives, or outputs data, a description of its inputs, outputs, and other data elements and data element assemblies, as applicable. Paragraph 4.3.x of this DID provides a list of topics to be covered, as applicable. Data local to the software unit shall be described separately from data input to or output from the software unit. If the software unit is a database, a corresponding Database Design Description (DBDD) shall be referenced; interface characteristics may be provided here or by referencing section 4 or the corresponding Interface Design Description(s) (IDD).

f. If the software unit contains logic, the logic to be used by the software unit, including, as applicable:

    1) Conditions in effect within the software unit when its execution is initiated
    2) Conditions under which control is passed to other software units
    3) Response and response time to each input, including data conversion, renaming, and data transfer operations

4) Sequence of operations and dynamically controlled sequencing during the software unit's operation, including:
   a) The method for sequence control
   b) The logic and input conditions of that method, such as timing variations, priority assignments
   c) Data transfer in and out of memory
   d) The sensing of discrete input signals, and timing relationships between interrupt operations within the software unit
5) Exception and error handling

6. Requirements traceability. This section shall contain:

   a. Traceability from each software unit identified in this SDD to the SCI requirements allocated to it. (Alternatively, this traceability may be provided in 4.1.)

   b. Traceability from each SCI requirement to the software units to which it is allocated.

7. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
INTERFACE DESIGN DESCRIPTION (IDD)	DID-FAA-026-10

3. DESCRIPTION/PURPOSE

3.1 The Interface Design Description (IDD) describes the interface characteristics of one or more systems, subsystems, Hardware Configuration Items (HWCIs), Software Configuration Items (SCIs), manual operations, or other system components. An IDD may describe any number of interfaces.

3.2 The IDD can be used to supplement the System/Subsystem Design Description (SSDD) (DID-FAA-026-06), Software Design Description (SDD) (DID-FAA-026-09), and Database Design Description (DBDD) (DID-FAA-026-11). The IDD and its companion Interface Requirements Specification (IRS)(DID-FAA-026-08) serve to communicate and control interface design decisions.

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the interface design of one or more systems, subsystems, HWCIs, SCIs, manual operations, or other system components.

7.3 The IRS specifies interface requirements; the IDD describes interface characteristics selected to meet those requirements. The IDD may reference the IRS to avoid repeating information. The IDD can be used to supplement the SSDD, SDD, or DBDD.

7.4 The Contract Data Requirements List (CDRL) (DD form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
NONE	**FAA-STD-026**	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Pages 2-6)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the systems, subsystems, or items to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system(s), the interfacing entities, and interfaces to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system(s) and software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Interface design. This section shall be divided into the following paragraphs to describe the interface characteristics of one or more systems, subsystems, configuration items, manual operations, or other system components. If part or all of the design depends upon system states or modes, this dependency shall be indicated. If design information falls into more than one paragraph, it may be presented once and referenced from the other paragraphs. If part or all of this information is documented elsewhere, it may be referenced. Design conventions needed to understand the design shall be presented or referenced.

3.1 Interface identification and diagrams. For each interface identified in 1.1, this paragraph shall state the project-unique identifier assigned to the interface and shall identify the interfacing entities (systems, configuration items, users, etc.) by name, number, version, and documentation references, as applicable. The identification shall state which entities have fixed interface characteristics (and therefore impose interface requirements on interfacing entities) and which are being developed or modified (thus having interface requirements imposed on them). One or more interface diagrams shall be provided, as appropriate, to depict the interfaces.

3.x (Project-unique identifier of interface). This paragraph (beginning with 3.2) shall identify an interface by project-unique identifier, shall briefly identify the interfacing entities, and shall be divided into subparagraphs as needed to describe the interface characteristics of one or both of the interfacing entities. If a given interfacing entity is not covered by this IDD (for example, an external system) but its interface characteristics need to be mentioned to describe interfacing entities that are, these characteristics shall be stated as assumptions or as "When [the entity not covered] does this, [the entity that is covered] will ...." This paragraph may reference other documents (such as data dictionaries, standards for protocols, and standards for user interfaces) in place of stating the information here.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

The design description shall include the following, as applicable, presented in any order suited to the information to be provided, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

a. Priority assigned to the interface by the interfacing entity(ies)

b. Type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

c. Characteristics of individual data elements that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., variable or field name in code or database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)

d. Characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the interfacing entity(ies) will provide, store, send, access, receive, etc., such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural language) name
        c) Technical name (e.g., record or data structure name in code or database)
        d) Abbreviations or synonymous names
    2) Data elements in the assembly and their structure (number, order, grouping)
    3) Medium (such as disk) and structure of data elements/assemblies on the medium
    4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
    5) Relationships among assemblies, such as sorting/access characteristics

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
7) Security and privacy constraints
8) Sources (setting/sending entities) and recipients (using/receiving entities)

e. Characteristics of communication methods that the interfacing entity(ies) will use for the interface, such as:

1) Project-unique identifier(s)
2) Communication links/bands/frequencies/media and their characteristics
3) Message formatting
4) Flow control (such as sequence numbering and buffer allocation)
5) Data transfer rate, whether periodic/aperiodic, and interval between transfers
6) Routing, addressing, and naming conventions
7) Transmission services, including priority and grade
8) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

f. Characteristics of protocols the interfacing entity(ies) will use for the interface, such as:

1) Project-unique identifier(s)
2) Priority/layer of the protocol
3) Packeting, including fragmentation and reassembly, routing, and addressing
4) Legality checks, error control, and recovery procedures
5) Synchronization, including connection establishment, maintenance, termination
6) Status, identification, and any other reporting features

g. Other characteristics, such as physical compatibility of the interfacing entity(ies) (dimensions, tolerances, loads, voltages, plug compatibility, etc.) or types and handling of errors that are not specified in the software requirements.

4. Requirements traceability. This paragraph shall contain:

a. Traceability from each interfacing entity covered by this IDD to the system or SCI requirements addressed by the entity's interface design.

b. Traceability from each system or SCI requirement that affects an interface covered in this IDD to the interfacing entities that address it.

5. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
DATABASE DESIGN DESCRIPTION (DBDD)	**DID-FAA-026-11**

3. DESCRIPTION/PURPOSE

3.1 The Database Design Description (DBDD) describes the design of a database, that is, a collection of related data stored in one or more computerized files in a manner that can be accessed by users or computer programs via a database management system (DBMS). It can also describe the software units used to access or manipulate the data.

3.2 The DBDD is used as the basis for implementing the database and related software units. It provides the acquirer visibility into the design and provides information needed for software support.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to define and record the design of one or more databases.

7.3 Software units that access or manipulate the database may be described here or in Software Design Descriptions (SDDs). Interfaces may be described here or in Interface Design Descriptions (IDDs).

7.4 The Contract Data Requirements List (CDRL) (DD form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the database to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 Database overview. This paragraph shall briefly state the purpose of the database to which this document applies. It shall describe the general nature of the database; summarize the history of its development, use, and maintenance; identify the project sponsor, acquirer, user, developer, and support organization; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this manual. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Database-wide design decisions. This section shall be divided into paragraphs as needed to present database-wide design decisions, that is, decisions about the database's behavioral design (how it will behave, from a user's point of view, in meeting its requirements, ignoring internal implementation) and other decisions affecting further design of the database. If all such decisions are explicit in the system or CSCI requirements, this section shall so state. Design decisions that respond to requirements designated critical, such as those for safety, security, or privacy, shall be placed in separate subparagraphs. If a design decision depends upon system states or modes, this dependency shall be indicated. If some or all of the design decisions are described in the documentation of a custom or commercial database management system (DBMS), they may be referenced from this section. Design conventions needed to understand the design shall be presented or referenced. Examples of database-wide design decisions are the following:

a. Design decisions regarding queries or other inputs the database will accept and outputs (displays, reports, messages, responses, etc.) it will produce, including interfaces with other systems, HWCIs, CSCIs, and users (5.x.d of this DID identifies topics to be considered in this description). If part or all of this information is given in Interface Design Descriptions (IDDs), they may be referenced.

b. Design decisions on database behavior in response to each input or query, including actions, response times and other performance characteristics, selected equations/algorithms/rules, disposition, and handling of unallowed inputs

c. Design decisions on how databases/data files will appear to the user (4.x of this DID identifies topics to be considered in this description)

d. Design decisions on the database management system to be used (including name, version/release) and the type of flexibility to be built into the database for adapting to changing requirements

e. Design decisions on the levels and types of availability, security, privacy, and continuity of operations to be offered by the database

f. Design decisions on database distribution (such as client/server), master database file updates and maintenance, including maintaining consistency, establishing/ re-establishing and maintaining synchronization, enforcing integrity and business rules

g. Design decisions on backup and restoration including data and process distribution strategies, permissible actions during backup and restoration, and special considerations for new or non-standard technologies such as video and sound

h. Design decisions on repacking, sorting, indexing, synchronization, and consistency including automated disk management and space reclamation considerations, optimizing strategies and considerations, storage and size considerations, and population of the database and capture of legacy data

4. Detailed design of the database. This section shall be divided into paragraphs as needed to describe the detailed design of the database. The number of levels of design and the names of those levels shall be based on the design methodology used. Examples of database design levels include conceptual, internal, logical, and physical. If part or all of the design depends upon system states or modes, this dependency shall be indicated. Design conventions needed to understand the design shall be presented or referenced.

Note: This DID uses the term "data element assembly" to mean any entity, relation, schema, field, table, array, etc., that has structure (number/order/grouping of data elements) at a given design level (e.g., conceptual, internal, logical, physical) and the term "data element" to mean any relation, attribute, field, cell, data element, etc. that does not have structure at that level.

4.x (Name of database design level). This paragraph shall identify a database design level and shall describe the data elements and data element assemblies of the database in the terminology of the selected design method. The information shall include the following, as applicable, presented in any order suited to the information to be provided:

a. Characteristics of individual data elements in the database design, such as:
    1) Names/identifiers
        a) Project-unique identifier
        b) Non-technical (natural-language) name
        c) Data element name
        d) Technical name (e.g., field name in the database)
        e) Abbreviation or synonymous names
    2) Data type (alphanumeric, integer, etc.)
    3) Size and format (such as length and punctuation of a character string)
    4) Units of measurement (such as meters, dollars, nanoseconds)
    5) Range or enumeration of possible values (such as 0-99)
    6) Accuracy (how correct) and precision (number of significant digits)
    7) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the data element may be updated and whether business rules apply
    8) Security and privacy constraints
    9) Sources (setting/sending entities) and recipients (using/receiving entities)

b. Characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) in the database design, such as:
   1) Names/identifiers
      a) Project-unique identifier
      b) Non-technical (natural language) name
      c) Technical name (e.g., record or data structure name in code or database)
      d) Abbreviations or synonymous names
   2) Data elements in the assembly and their structure (number, order, grouping)
   3) Medium (such as disk) and structure of data elements/assemblies on the medium
   4) Visual and auditory characteristics of displays and other outputs (such as colors, layouts, fonts, icons and other display elements, beeps, lights)
   5) Relationships among assemblies, such as sorting/access characteristics
   6) Priority, timing, frequency, volume, sequencing, and other constraints, such as whether the assembly may be updated and whether business rules apply
   7) Security and privacy constraints
   8) Sources (setting/sending entities) and recipients (using/receiving entities)

5. Detailed design of software units used for database access or manipulation. This section shall be divided into the following paragraphs to describe each software unit used for database access or manipulation. If part or all of this information is provided elsewhere, such as in a Software Design Description (SDD), the SDD for a customized DBMS, or the user manual of a commercial DBMS, that information may be referenced rather than repeated here. If part or all of the design depends upon system states or modes, this dependency shall be indicated. If design information falls into more than one paragraph, it may be presented once and referenced from the other paragraphs. Design conventions needed to understand the design shall be presented or referenced.

5.x (Project-unique identifier of a software unit, or designator for a group of software units). This paragraph shall identify a software unit by project-unique identifier and shall describe the unit. The description shall include the following information, as applicable. Alternatively, this paragraph may designate a group of software units and identify and describe the software units in subparagraphs. Software units that contain other software units may reference the descriptions of those units rather than repeating information.

a. Unit design decisions, if any, such as algorithms to be used, if not previously selected

b. Any constraints, limitations, or unusual features in the design of the software unit

c. The programming language to be used and rationale for its use if other than the specified CSCI language

d. If the software unit consists of or contains procedural commands (such as menu selections in a database management system (DBMS) for defining forms and reports, on-line DBMS queries for database access and manipulation, input to a computer human interface (CHI) builder for automated code generation, commands to the operating system, or shell scripts), a list of the procedural commands and a reference to user manuals or other documents that explain them

e. If the software unit contains, receives, or outputs data, a description of its inputs, outputs, and other data elements and data element assemblies, as applicable. Data local to the software unit shall be described separately from data input to or output from the software unit. Interface characteristics may be provided here or by referencing Interface Design Description(s). If a given interfacing entity is not covered by this DBDD (for example, an external system) but its interface characteristics need to be mentioned to describe software units that are, these characteristics shall be stated as assumptions or as "When [the entity not covered] does this, [the software unit] will...." This paragraph may reference other documents (such as data dictionaries, standards for protocols, and standards for user interfaces) in place of stating the information here. The design description shall include the following, as applicable, presented in any order suited to the information to be provided, and shall note any differences in these characteristics from the point of view of the interfacing entities (such as different expectations about the size, frequency, or other characteristics of data elements):

1) Project-unique identifier for the interface

2) Identification of the interfacing entities (software units, configuration items, users, etc.) by name, number, version, and documentation references, as applicable

3) Priority assigned to the interface by the interfacing entity(ies)

4) Type of interface (such as real-time data transfer, storage-and-retrieval of data, etc.) to be implemented

5) Characteristics of individual data elements that the interfacing entity(ies) will provide, store, send, access, receive, etc. Paragraph 4.x.a of this DID identifies topics to be covered in this description.

6) Characteristics of data element assemblies (records, messages, files, arrays, displays, reports, etc.) that the interfacing entity(ies) will provide, store, send, access, receive, etc. Paragraph 4.x.b of this DID identifies topics to be covered in this description.

7) Characteristics of communication methods that the interfacing entity(ies) will use for the interface, such as:
   a) Project-unique identifier(s)
   b) Communication links/bands/frequencies/media and their characteristics
   c) Message formatting
   d) Flow control (such as sequence numbering and buffer allocation)
   e) Data transfer rate, whether periodic/aperiodic, and interval between transfers
   f) Routing, addressing, and naming conventions
   g) Transmission services, including priority and grade
   h) Safety/security/privacy considerations, such as encryption, user authentication, compartmentalization, and auditing

8) Characteristics of protocols that the interfacing entity(ies) will use for the interface, such as:
   a) Project-unique identifier(s)
   b) Priority/layer of the protocol
   c) Packeting, including fragmentation and reassembly, routing, and addressing
   d) Legality checks, error control, and recovery procedures
   e) Synchronization, including connection establishment, maintenance, termination
   f) Status, identification, and any other reporting features

9) Other characteristics, such as physical compatibility of the interfacing entity(ies) (dimensions, tolerances, loads, voltages, plug compatibility, etc.)

f. If the software unit contains logic, the logic to be used by the software unit, including, as applicable:
   1) Conditions in effect within the software unit when its execution is initiated
   2) Conditions under which control is passed to other software units
   3) Response and response time to each input, including data conversion, renaming, and data transfer operations
   4) Sequence of operations and dynamically controlled sequencing during the software unit's operation, including:
      a) The method for sequence control
      b) The logic and input conditions of that method, such as timing variations, priority assignments
      c) Data transfer in and out of memory
      d) The sensing of discrete input signals, and timing relationships between interrupt operations within the software unit
   5) Exception and error handling

6. Requirements traceability. This section shall contain:

   a. Traceability from each database or other software unit covered by this DBDD to the system or CSCI requirements it addresses.

   b. Traceability from each system or CSCI requirement that has been allocated to a database or other software unit covered in this DBDD to the database or other software units that address it.

7. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE TEST PLAN (STP)	DID-FAA-026-12

3. DESCRIPTION/PURPOSE

3.1 The Software Test Plan (STP) describes plans for qualification testing of Software Configuration Items (SCI's), software systems and software products. It describes the software test environment to be used for the testing, identifies the tests to be performed, and provides schedules for test activities.

3.2 The Software Test Plan DID format will be tailored to the type of test and/or phase of testing required by contract (production acceptance, site acceptance, factory acceptance, software, system, etc.)

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the contractor is tasked to develop and record plans for conducting software test activities.

7.3 The Contract Data Requirements List (CDRL) (DD Form 1423, or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

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c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin here. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Introduction. This section shall be divided into the following paragraphs.

1.1 Background. This paragraph shall briefly state the purpose of the system and the software products to which this document applies. It shall describe the general nature of the system and software products; summarize the history of system development.

1.2 Purpose. This paragraph defines the specific purpose of the plan for software. It shall describe the test environments, test identifications, and a general schedule for test activities for the respective phase.

1.3 Scope. This paragraph shall identify the segment of the test program the test plan will address.

2. Referenced documents. This section shall list the number, title, and date of all documents needed to implement the test program referenced in this plan. It shall include references to any policies and laws, which direct the test program. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. System Description. This section shall describe the system to be tested. It contains the following paragraphs.

3.1 Software System Overview. This paragraph shall describe the software system to be tested and their major functions. It shall contain a block diagram of the system/software products and the hardware.

3.2 Software Interfaces Overview. This paragraph shall contain a simplified block diagram with a functional description of each interface. The paragraph includes facility interfaces, remote maintenance monitoring interface, voice communications interface, operator interface, and any interface required to validate the system specification requirements.

4. Test Program Management. This section shall include the following paragraphs.

4.1 Schedules. This paragraph shall include a test schedule which show the interdependencies of other program milestones. It will identify to the extent possible all tests to be performed in the phase.

4.2 Risk Management. This paragraph shall describe the process for test risk management, technical, cost, and schedule risk issues or any limitation which could result in incomplete resolutions of test requirements. This paragraph shall include planned work-a-rounds and resolutions.

4.3 Test management Organization. This paragraph describes the structure and composition of the test organizations and personnel responsible for carrying out the testing. The following areas will be addressed.

4.4.1 Responsibilities and Authority. This paragraph will identify the organization responsible for the execution of the test phase. It also identifies other personnel who will conduct and support the testing. It shall list the position and describe the duties of each member of the test conduct team (i.e.test manager, observers, etc).

4.4.2 Other Participating Organizations. This paragraph describes the specific roles and responsibilities for organizations outside the immediate test conduct team and the specific roles they will have during the testing phase (ie. IPT)

4.5 Training. This paragraph shall describe the range and level of training and familiarization needed to develop test procedures and execute tests. This paragraph also describes any special knowledge needed by the test team (s) (e.g., familiarization with the test program and the test facility, orientation briefings, user instruction, the use of special test tools, etc).

4.6 Quality Control Measures. This section shall identify the specific configuration management process for the test phase. It identifies how changes to the baseline system will be controlled.

4.7 Environment/Infrastructure. This paragraph shall describe the process of ensuring that the infrastructure needed to manage the test program and perform the tests is maintained. Functionality, performance, safety, security, availability, space requirements, equipment, cost, and time constraints are items to be considered when monitoring test infrastructure.

5. Software test environment. This section shall be divided into the following paragraphs to describe the software test environment at each intended test site. Reference may be made to the Software Development Plan (SDP) for resources that are described there.

5.x (Name of test site(s)). This paragraph shall identify one or more test sites to be used for the testing, and shall be divided into the following subparagraphs to describe the software test environment at the site(s). If all tests will be conducted at a single site, this paragraph and its subparagraphs shall be presented only once. If multiple test sites use the same or similar software test environments, they may be discussed together. Duplicative information among test site descriptions may be reduced by referencing earlier descriptions.

5.x.1 Software items. This paragraph shall identify by name, number, and version, as applicable, the software items (e.g., operating systems, compilers, communications software, related applications software, databases, input files, code auditors, dynamic path analyzers, test drivers, preprocessors, test data generators, test control software, other special test software, post-processors) necessary to perform the planned testing activities at the test

site(s). This paragraph shall describe the purpose of each item, describe its media (tape, disk, etc.), identify those that are expected to be supplied by the site, and identify any classified processing or other security or privacy issues associated with the software items.

5.x.2 Hardware and firmware items. This paragraph shall identify by name, number, and version, as applicable, the computer hardware, interfacing equipment, communications equipment, test data reduction equipment, apparatus such as extra peripherals (tape drives, printers, plotters), test message generators, test timing devices, test event records, etc., and firmware items that will be used in the software test environment at the test site(s). This paragraph shall describe the purpose of each item, state the period of usage and the number of each item needed, identify those that are expected to be supplied by the site, and identify any classified processing or other security or privacy issues associated with the items.

5.x.3 Other materials. This paragraph shall identify and describe any other materials needed for the testing at the test site(s). These materials may include manuals, software listings, media containing the software to be tested, media containing data to be used in the tests, sample listings of outputs, and other forms or instructions. This paragraph shall identify those items that are to be delivered to the site and those that are expected to be supplied by the site. The description shall include the type, layout, and quantity of the materials, as applicable. This paragraph shall identify any classified processing or other security or privacy issues associated with the items.

5.x.4 Proprietary nature, acquirer's rights, and licensing. This paragraph shall identify the proprietary nature, acquirer's rights, and licensing issues associated with each element of the software test environment.

5.x.5 Installation, testing, and control. This paragraph shall identify the developer's plans for performing each of the following, possibly in conjunction with personnel at the test site(s):

a. Acquiring or developing each element of the software test environment
b. Installing and testing each item of the software test environment prior to its use
c. Controlling and maintaining each item of the software test environment

6. Test Program Description. This section contains the following paragraphs, which describe the planned test program and the tests to be conducted.

6.1 General Information. This paragraph shall be divided into subparagraphs to present general information applicable to the overall testing to be performed.

6.1.1 Test levels. This paragraph shall describe the levels at which testing will be performed, for example, CSCI level, or system level.

6.1.2 Test classes. This paragraph shall describe the types or classes of tests that will be performed (for example, timing tests, erroneous input tests, maximum capacity tests).

6.1.3 General test conditions. This paragraph shall describe conditions that apply to all of the tests or to a group of tests. For example: "Each test shall include nominal, maximum, and minimum values;" "each test of type x shall use live data;" "execution size and time shall be measured for each CSCI." Included shall be a statement of the extent of testing to be performed and rationale for the extent selected. Also included shall be the approach to be followed for retesting/regression testing.

6.1.4 Test progression. In cases of progressive or cumulative tests, this paragraph shall explain the planned sequence or progression of tests.

6.1.5 Data recording, reduction, and analysis. This paragraph shall identify and describe the data recording, reduction, and analysis procedures to be used during and after the tests identified in this STP.

These procedures shall include, as applicable, manual, automatic, and semi-automatic techniques for recording test results, manipulating the raw results into a form suitable for evaluation, and retaining the results of data reduction and analysis.

6.1.6 Discrepancy Reporting and Corrective Actions. This paragraph shall describe the Discrepancy reporting and Corrective Action program that supports the test program. The Discrepancy Reporting and Corrective Action forms and instructions for completing those forms are included in this section.

6.5.2 Planned tests. This paragraph shall list each test to be conducted during this test phase. The test descriptions for the tests listed are attached as Appendix A of this plan. The following information shall be supplied in each test description:

a. **Test Title**. Specify the title of the test/evaluation and a number designation
b. **Test or Evaluation Objective**: List the objectives/requirements the test will validate and the test success criteria
c. **Test or Evaluation Approach**: State the methods used to meet the test objective
d. **Test Level**: State the software level to which the test will be executed.
e. **Execution Time**: Estimate the total time it will take to execute the test(s) described, including multiple runs of a test procedure
f. **Location**: Identify the testing location
g. **Tasks/Activities**: List tasks and activities that will occur during the test
h. **Personnel**: Identify the number and type of personnel required to accomplish the test.
i. **Test Equipment**: Identify all test equipment (hardware and software) required to accomplish the test. Define any analysis tools that will be used to support the test.
j. **Data Reduction/Analysis**: describe the test data reduction method, in relation to the Test equipment idnetified in item h that will support the test.
k. **General Test Conditions**: Describe any special test conditions, test scenarios, or special operating conditions required to accomplish the test.

7. Requirements traceability. This paragraph shall contain:

   a. Traceability from each test identified in this plan to the CSCI requirements and, if applicable, software system requirements it addresses. ~~.~~

   b. Traceability from each SCI requirement and, if applicable, each software system requirement covered by this test plan to the test(s) that address it. The traceability shall cover the SCI requirements in all applicable Software Requirements Specifications (SRSs) and associated Interface Requirements Specifications (IRSs), and, for software systems, the system requirements in all applicable System/ Subsystem Specifications (SSSs) and associated system-level IRSs.

NOTE: This method is referred to as tracing requirements both forward and back .

8. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE TEST PROCEDURES (STPr)	DID-FAA-026-13

3. DESCRIPTION/PURPOSE

3.1 The Software Test Procedures (STPr) describes the test preparations, test cases, and test procedures to be used to perform qualification testing of a Software Configuration Item (SCI) or a software system or subsystem.

3.2 The STPr enables the acquirer to assess the adequacy of the qualification testing to be performed.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to develop Software Test Procedures (STPr). The STPr will include, records of the test preparations, test cases, and test procedures to be used for SCI qualification testing or for system qualification testing of a software system and products.

7.3 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	**FAA-STD-026**	**N/A**

1. PREPARATION INSTRUCTIONS

10.1 Format instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page which contains, as applicable: the official title of the system; the title of the test procedures (i.e Developmental Test and Evaluation (DT&E) procedures, Site Acceptance Test (SAT) procedures); date; signatures of the approving authority (ies) and the name of the issuing organization; document number; volume number; version/revision indicator; contract number; CDRL item number. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number(s) of titled paragraphs. Figures, and tables will be listed separately. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS – 10.2 Content Requirements (continued)

1. Introduction. This section shall be divided into the following paragraphs.

1.1 Scope. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s); title(s); abbreviation(s); contractor name, version number(s), and release number(s). It shall specify the requirement numbers from the contract system specification which have been assigned to the test procedure.

1.2 Purpose. This paragraph shall state the purpose of test to be accomplished. It shall define when and how to perform certain jobs, including needed tools. It shall describe in general terms the type of test to be accomplished and how the test relates to the overall test program.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This paragraph shall describe the relationship, if any, of the STPr to related test procedures or task descriptions which elaborate details of the procedure.

3. Software System Description. This section shall describe the system to be tested. It contains the following paragraphs.

3.1 Software System Overview. This paragraph shall describe the system or software products to be tested and their major functions. It shall contain a block diagram of the system/software products and the hardware.

3.2 Software Interfaces Overview. This paragraph shall contain a simplified block diagram with a functional description of each interface under test. The paragraph includes facility interfaces, remote maintenance monitoring interface, voice communications interface, operator interface, and any interface required to validate the system specification requirements.

3.3 Test setup. This paragraph shall contain a detailed block diagram of the test interfaces and setup. The diagram and text include all connection points, test points, and controls. All test equipment will be identified on the diagram with connection points.

4. Test Configuration and preparations. This paragraph shall identify the specific test configuration under which the procedure will be executed. This section shall be divided into the following paragraphs to denote preparation necessary to achieve the desired configuration. Safety precautions, marked by WARNING or CAUTION, and security and privacy considerations shall be included as applicable. When the information required duplicates information previously specified for another test, that information may be referenced rather than repeated.

4.1 (Project-unique identifier of a test). This paragraph shall identify a test by project-unique identifier, shall provide a brief description, and shall be divided into the following subparagraphs. When the information required duplicates information previously specified for another test, that information may be referenced rather than repeated.

4.2 Hardware preparation. This paragraph shall describe the procedures necessary to prepare the hardware for the test. Reference may be made to publish~~ed~~ operating manuals for these procedures. The following shall be provided, as applicable:

a. The specific hardware to be used, identified by name and, if applicable, serial number and calibration date.
b. Any switch settings and cabling necessary to connect the hardware
c. One or more diagrams to show hardware, interconnecting control, and data paths
d. Step-by-step instructions for placing the hardware in a state of readiness

4.3 Software preparation. This paragraph shall describe the procedures necessary to prepare the item(s) under test and any related software, including data, for the test. Reference may be made to published software manuals for these procedures. The following information shall be provided, as applicable:

a. The specific software to be used in the test, include version numbers.

b. The storage medium of the item(s) under test (e.g., magnetic tape, diskette)

c. The storage medium of any related software (e.g., simulators, test drivers, databases)

d. Instructions for loading the software, including required sequence

e. Instructions for software initialization common to more than one test case

4.4 Other pre-test preparations. This paragraph shall describe any other pre-test personnel actions, preparations, or procedures necessary to perform the test.

5. Software Test Case Preparation:

5.1 This section identifies the procedures for preparing Test Cases.

5.2 (Project-unique identifier of a test case). This paragraph shall identify a test case by project-unique identifier, state its purpose, and provide a brief description. The following subparagraphs shall provide a detailed description of the test case.

5.3 Requirements addressed. This paragraph shall identify the SCI or system requirements addressed by the test case. (Alternatively, this information may be provided in 5.a.)

5.4 Prerequisite conditions. This paragraph shall identify any prerequisite conditions that must be established prior to performing the test case. The following considerations shall be discussed, as applicable:

a. Hardware and software configuration

b. Flags, initial breakpoints, pointers, control parameters, or initial data to be set/reset prior to test commencement

c. Preset hardware conditions or electrical states necessary to run the test case

d. Initial conditions to be used in making timing measurements

e. Conditioning of the simulated environment

f. Other special conditions peculiar to the test case

5.5 Personnel Requirements. This paragraph shall identify personnel required to run the test (i.e. engineers, technicians, quality assurance personnel, etc).

5.6 Test inputs. This paragraph shall describe the test inputs necessary for the test case. The following shall be provided, as applicable:

a. Name, purpose, and description (e.g., range of values, accuracy) of each test input

b. Source of the test input and the method to be used for selecting the test input

c. Whether the test input is real or simulated

d. Time or event sequence of test input

e. The manner in which the input data will be controlled to:

1) Test the item(s) with a minimum/reasonable number of data types and values

2) Exercise the item(s) with a range of valid data types and values that test for overload, saturation, and other "worst case" effects

3) Exercise the item(s) with invalid data types and values to test for appropriate handling of irregular inputs

4) Permit retesting, if necessary

5.7 Expected test results. This paragraph shall identify all expected test results for the test case. Both intermediate and final test results shall be provided, as applicable.

5.8 Criteria for evaluating results. This paragraph shall identify the criteria to be used for evaluating the intermediate and final results of the test case. For each test result, the following information shall be provided, as applicable:

a. The range or accuracy over which an output can vary and still be acceptable

b. Minimum number of combinations or alternatives of input and output conditions that constitute an acceptable test result

c. Maximum/minimum allowable test duration, in terms of time or number of events

d. Maximum number of interrupts, halts, or other system breaks that may occur

e. Allowable severity of processing errors

f. Conditions under which the result is inconclusive and re-testing is to be performed

g. Conditions under which the outputs are to be interpreted as indicating irregularities in input test data, in the test database/data files, or in test procedures

h. Allowable indications of the control, status, and results of the test and the readiness for the next test case (may be output of auxiliary test software)

i. Additional criteria not mentioned above.

5.9 Test Case procedure. This paragraph shall define the test procedure for the test case. The test procedure shall be defined as a series of individually numbered steps listed sequentially in the order in which the steps are to be performed. For convenience in document maintenance, the test procedures may be included as an appendix and referenced in this paragraph. The appropriate level of detail in each test procedure depends on the type of software being tested. For some software, each keystroke may be a separate test procedure step; for most software, each step may include a logically related series of keystrokes or other actions. The appropriate level of detail is the level at which it is useful to specify expected results and compare them to actual results. The following shall be provided for each test procedure, as applicable:

a. Test operator actions and equipment operation required for each step, including commands, as applicable, to:

1) Initiate the test case and apply test inputs
2) Inspect test conditions
3) Perform interim evaluations of test results
4) Record data
5) Halt or interrupt the test case
6) Request data dumps or other aids, if needed
7) Modify the database/data files
8) Repeat the test case if unsuccessful
9) Apply alternate modes as required by the test case
10) Terminate the test case

b. Expected result and evaluation criteria for each step

c. If the test case addresses multiple requirements, identification of which test procedure step(s) address which requirements. (Alternatively, this information may be provided in 5.)

d. Actions to follow in the event of a program stop or indicated error, such as:
   1) Recording of critical data from indicators for reference purposes
   2) Halting or pausing time-sensitive test-support software and test apparatus
   3) Collection of system and operator records of test results

5.10 Data Reduction and Analysis. This paragraph shall identify procedures to be used to reduce and analyze test results. It shall specify whether the data is to be recorded manually or automatically. Requirements for data recording, reduction and analysis should be specified in a manner and detail such that resulting information will clearly indicate whether or not the requirements have been met.

5.11 Assumptions and constraints. This paragraph shall identify any assumptions made and constraints or limitations imposed in the description of the test case due to system or test conditions, such as limitations on timing, interfaces, equipment, personnel, and database/data files. If waivers or exceptions to specified limits and parameters are approved, they shall be identified and this paragraph shall address their effects and impacts upon the test case.

6. Requirements traceability. This paragraph shall contain:

a. Traceability from each test case in this STD to the system or SCI requirements it addresses. If a test case addresses multiple requirements, traceability from each set of test procedure steps to the requirement(s) addressed. (Alternatively, this traceability may be provided in 4.x.y.1.)

b. Traceability from each system or SCI requirement covered by this STD to the test case(s) that address it. For CSCI testing, traceability from each SCI requirement in the SCI's Software Requirements Specification (SRS) and associated Interface Requirements Specifications (IRSs). For system testing, traceability from each system requirement in the system's System/Subsystem Specification (SSS) and associated IRSs. If a test case addresses multiple requirements, the traceability shall indicate the particular test procedure steps that address each requirement.

10. PREPARATION INSTRUCTIONS – 10.2 Content Requirements (continued)

7. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rational). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE TEST REPORT (STR)	DID-FAA-026-14

3. DESCRIPTION/PURPOSE

3.1 The Software Test Report (STR) is a record of the qualification testing performed on a Software Configuration Item (SCI), a software system or subsystem, or other software-related item/products.

3.2 The STR enables the acquirer to assess the testing and its results.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the contractor is tasked to develop and record the results of software test activities.

7.3 The Contract Data Requirements List (CDRL) (DD Form 1423, or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software items; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this report. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Overview of test results. This section shall be divided into the following paragraphs to provide an overview of test results.

3.1 Overall assessment of the software tested. This paragraph shall:

a. Provide an overall assessment of the software as demonstrated by the test results in this report. Provide rationale for the assessment.

b. Identify any remaining deficiencies, limitations, or constraints that were detected by the testing performed. Problem/change reports may be used to provide deficiency information.

c. For each remaining deficiency, limitation, or constraint, describe:

1) Its impact on software and system performance, including identification of requirements not met

2) The impact on software and system design to correct it

3) A recommended solution/approach for correcting it

d. Identify any deferred testing and provide a justification for the deferral

3.2 Impact of test environment. This paragraph shall provide an assessment of the manner in which the test environment may be different from the operational environment and the effect of this difference on the test results.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3.3 Recommended improvements. This paragraph shall provide any recommended improvements in the design, operation, or testing of the software tested. A discussion of each recommendation and its impact on the software may be provided. If no recommended improvements are provided, this paragraph shall state "None."

4. Detailed test results. This section shall be divided into the following paragraphs to describe the detailed results for each test. Note: The word "test" means a related collection of test cases.

4.x (Project-unique identifier of a test). This paragraph shall identify a test by project-unique identifier and shall be divided into the following subparagraphs to describe the test results.

4.x.1 Summary of test results. This paragraph shall summarize the results of the test. The summary shall include, possibly in a table, the completion status of each test case associated with the test (for example, "all results as expected," "problems encountered," "deviations required"). When the completion status is not "as expected," this paragraph shall reference the following paragraphs for details.

4.x.2 Participants: This paragraph shall identify the names of all participants and the functions they performed.

4.x.3 Problems encountered. This paragraph shall be divided into subparagraphs that identify each test case in which one or more problems occurred.

4.x.3.y (Project-unique identifier of a test case). This paragraph shall identify by project-unique identifier a test case in which one or more problems occurred, and shall provide:

a. A brief description of the problem(s) that occurred

b. Identification of the test procedure step(s) in which they occurred

c. Reference(s) to the associated problem/change report(s) and backup data, as applicable

d. The number of times the procedure or step was repeated in attempting to correct the problem(s) and the outcome of each attempt

e. Back-up points or test steps where tests were resumed for retesting

4.x.4 Deviations from test cases/procedures. This paragraph shall be divided into subparagraphs that identify each test case in which deviations from test case/test procedures occurred. It shall identify define the schedule and method of incorporating identified changes into the next scheduled test, if applicable.

4.x.4.y (Project-unique identifier of a test case). This paragraph shall identify by project-unique identifier a test case in which one or more deviations occurred, and shall provide:

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

a. A description of the deviation(s) (for example, test case run in which the deviation occurred and nature of the deviation, such as substitution of required equipment, procedural steps not followed, schedule deviations). (Red-lined test procedures may be used to show the deviations)

b. The rationale for the deviation(s)

c. An assessment of the deviations' impact on the validity of the test case

4.x.5. Data Collection and Analysis: This section shall explain how test data were collected and the method of analysis used to obtain results.

5. Test log. This section shall present, possibly in a figure or appendix, a chronological record of the test events covered by this report. This test log shall include:

a. The date(s), time(s), and location(s) of the tests performed

b. The hardware and software configurations used for each test including, as applicable, part/model/serial number, manufacturer, revision level, and calibration date of all hardware, and version number and name for the software components used

c. The date and time of each test-related activity, the identity of the individual(s) who performed the activity, and the identities of witnesses, as applicable

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, bibliography). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE PRODUCT SPECIFICATION (SPS)	**DID-FAA-026-15**

3. DESCRIPTION/PURPOSE

3.1 The Software Product Specification (SPS) contains or references the executable software, source files, and software support information, including "as built" design information and compilation, build, and modification procedures, for a Computer Software Configuration Item (CSCI).

3.2 The SPS can be used to order the executable software and/or source files for a CSCI and is the primary software support document for the CSCI. Note: Different organizations have different policies for ordering delivery of software. These policies should be determined before applying this DID.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to prepare executable software, source files, "as built" CSCI design, and/or related support information for delivery.

7.3 The Contract Data Requirements List (CDRL) (DD form 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this specification. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Requirements. This section shall be divided into the following paragraphs to achieve delivery of the software and to establish the requirements that another body of software must meet to be considered a valid copy of the CSCI.

> *Note: This section establishes the software itself as the criterion that must be matched for a body of software to be considered a valid copy of the CSCI. The updated software design has been placed in Section 5 below, not as a requirement, but as information to be used to modify, enhance, or otherwise support the software. If any portion of this specification is placed under acquirer configuration control, it should be limited to Section 3. It is the software itself that establishes the product baseline, not a description of the software's design.*

3.1 Executable software. This paragraph shall provide, by reference to enclosed or otherwise provided electronic media, the executable software for the CSCI, including any batch files, command files, data files, or other software files needed to install and operate the software on its target computer(s). In order for a body of software to be considered a valid copy of the CSCI's executable software, it must be shown to match these files exactly.

3.2 Source files. This paragraph shall provide, by reference to enclosed or otherwise provided electronic media, the source files for the CSCI, including any batch files, command files, data files, or other files needed to regenerate the executable software for the CSCI. In order for a body of software to be considered a valid copy of the CSCI's source files, it must be shown to match these files exactly.

3.3 Packaging requirements. This paragraph shall state the requirements, if any, for packaging and marking copies of the CSCI.

4. Qualification provisions. This paragraph shall state the method(s) to be used to demonstrate that a given body of software is a valid copy of the CSCI. For example, the method for executable files might be to establish that each executable file referenced in 3.1 has an identically-named counterpart in the software in question and that each such counterpart can be shown, via bit-for-bit comparison, check sum, or other method, to be identical to the corresponding executable file. The method for source files might be comparable, using the source files referenced in 3.2.

5. Software support information. This section shall be divided into the following paragraphs to provide information needed to support the CSCI.

5.1 "As built" software design. This paragraph shall contain, or reference an appendix or other deliverable document that contains, information describing the design of the "as built" CSCI. The information shall be the same as that required in a Software Design Description (SDD), Interface Design Description (IDD), and Database Design Description (DBDD), as applicable. If these documents or their equivalents are to be delivered for the "as built" CSCI, this paragraph shall reference them. If not, the information shall be provided in this document. Information provided in the headers, comments, and code of the source code listings may be referenced and need not be repeated in this section. If the SDD, IDD, or DBDD is included in an appendix, the paragraph numbers and page numbers need not be changed.

5.2 Compilation/build procedures. This paragraph shall describe, or reference an appendix that describes, the compilation/build process to be used to create the executable files from the source files and to prepare the executable files to be loaded into firmware or other distribution media. It shall specify the compiler(s)/assembler(s) to be used, including version numbers; other hardware and software needed, including version numbers; any settings, options, or conventions to be used; and procedures for compiling/assembling, linking, and building the CSCI and the software system/subsystem containing the CSCI, including variations for different sites, configurations, versions, etc. Build procedures above the CSCI level may be presented in one SPS and referenced from the others.

5.3 Modification procedures. This paragraph shall describe procedures that must be followed to modify the CSCI. It shall include or reference information on the following, as applicable:

a. Support facilities, equipment, and software, and procedures for their use
b. Databases/data files used by the CSCI and procedures for using and modifying them
c. Design, coding, and other conventions to be followed
d. Compilation/build procedures if different from those above
e. Integration and testing procedures to be followed

5.4 Computer hardware resource utilization. This paragraph shall describe the "as built" CSCI's measured utilization of computer hardware resources (such as processor capacity, memory capacity, input/output device capacity, auxiliary storage capacity, and communications/network equipment capacity). It shall cover all computer hardware resources included in utilization requirements for the CSCI, in system-level resource allocations affecting the CSCI, or in the software development plan. If all utilization data for a given computer hardware resource is presented in a single location, such as in one SPS, this paragraph may reference that source. Included for each computer hardware resource shall be:

a. The CSCI requirements or system-level resource allocations being satisfied. (Alternatively, the traceability to CSCI requirements may be provided in 6.c.)

b. The assumptions and conditions on which the utilization data are based (for example, typical usage, worst-case usage, assumption of certain events)

c. Any special considerations affecting the utilization (such as use of virtual memory, overlays, or multiprocessors or the impacts of operating system overhead, library software, or other implementation overhead)

d. The units of measure used (such as percentage of processor capacity, cycles per second, bytes of memory, kilobytes per second)

e. The level(s) at which the estimates or measures have been made (such as software unit, CSCI, or executable program)

6. Requirements traceability. This section shall provide:

a. Traceability from each CSCI source file to the software unit(s) that it implements.

b. Traceability from each software unit to the source files that implement it.

c. Traceability from each computer hardware resource utilization measurement given in 5.4 to the CSCI requirements it addresses. (Alternatively, this traceability may be provided in 5.4.)

d. Traceability from each CSCI requirement regarding computer hardware resource utilization to the utilization measurements given in 5.4.

7. Notes. This section shall contain any general information that aids in understanding this specification (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE VERSION DESCRIPTION (SVD)	DID-FAA-STD-026-16

3. DESCRIPTION/PURPOSE

3.1 The Software Version Description (SVD) identifies and describes a software version consisting of one or more Software Configuration Items (SCIs). It is used to release, track, and control software versions.

3.2 The term "version" may be applied to the initial release of the software, to a subsequent release of that software, or to one of multiple forms of the software released at approximately the same time (for example, to different sites).

4. APPROVAL DATE	5. OFFICE OF PRIMARY RESPONSIBILITY	6a. DTIC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record the exact version of software to be delivered to a user, support, or other site.

7.3 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. APPLICABLE FORMS	9b. AMSC NUMBER
None	N/A	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s). It shall also identify the intended recipients of the SVD to the extent that this identification affects the contents of the software released (for example, source code may not be released to all recipients.)

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support organization; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this document. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Version description. This section shall be divided into the following paragraphs.

3.1 Inventory of materials released. This paragraph shall list by identifying numbers, titles, abbreviations, dates, version numbers, and release numbers, as applicable, all physical media (for example, listings, tapes, disks) and associated documentation that make up the software version being released. It shall include applicable security and privacy considerations for these items, safeguards for handling them, such as concerns for static and magnetic fields, and instructions and restrictions regarding duplication and license provisions.

3.2 Inventory of software contents. This paragraph shall list by identifying numbers, titles, abbreviations, dates, version numbers, and release numbers, as applicable, all computer files that make up the software version being released. Any applicable security and privacy considerations shall be included.

3.3 Changes installed. This paragraph shall contain a list of all changes incorporated into the software version since the previous version. If change classes have been used, the changes shall be separated into these classes. This paragraph shall identify, as applicable, the problem reports, change proposals, and change notices associated with each change and the effects, if any, of each change on system operation and on interfaces with other hardware and software. This paragraph does not apply to the initial software version.

3.4 Adaptation data. This paragraph shall identify or reference all adaptation data contained in the software version. For software versions after the first, this paragraph shall describe changes made to the adaptation data.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

3.5 Related documents. This paragraph shall list by identifying numbers, titles, abbreviations, dates, version numbers, and release numbers, as applicable, all documents pertinent to the software version being released but not included in the release.

3.6 Installation instructions. This paragraph shall provide or reference the following information, as applicable:

a. Instructions for installing the software version

b. Identification of other changes that have to be installed for this version to be used, including site-unique adaptation data not included in the software version

c. Security, privacy, or safety precautions relevant to the installation

d. Procedures for determining whether the version has been installed properly

e. A point of contact to be consulted if there are problems or questions with the installation

3.7 Possible problems and known errors. This paragraph shall identify any possible problems or known errors with the software version at the time of release, any steps being taken to resolve the problems or errors, and instructions (either directly or by reference) for recognizing, avoiding, correcting, or otherwise handling each one. The information presented shall be appropriate to the intended recipient of the SVD (for example, a user may need advice on avoiding errors, a support organization on correcting them).

4. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of any terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE USER MANUAL (SUM)	DID-FAA-026-17

3. DESCRIPTION/PURPOSE

3.1 The Software User Manual (SUM) tells a hands-on software user how to install and use a Software Configuration Item (SCI), a group of related SCIs, or a software system or subsystem. It may also cover a particular aspect of software operation, such as instructions for a particular position or task.

3.2 The SUM is developed for software that is run by the user and has a user interface requiring on-line user input or interpretation of displayed output. If the software is embedded in a hardware-software system, user manuals or operating procedures for that system may make separate SUMs unnecessary.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record information needed by hands-on users of software.

7.3 The SUM is an alternative to the Software Input/Output Manual (SIOM DID-FAA-026-19) and Software Center Operator Manual (SCOM DID-FAA-026-18).

7.4 The Contract Data Requirements List (CDRL DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2-7)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 CONTENT REQUIREMENTS (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this manual and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this manual. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Software summary. This section shall be divided into the following paragraphs.

3.1 Software application. This paragraph shall provide a brief description of the intended uses of the software. Capabilities, operating improvements, and benefits expected from its use shall be described.

3.2 Software inventory. This paragraph shall identify all software files, including databases and data files, that must be installed for the software to operate. The identification shall include security and privacy considerations for each file and identification of the software necessary to continue or resume operation in case of an emergency.

3.3 Software environment. This paragraph shall identify the hardware, software, manual operations, and other resources needed for a user to install and run the software. Included, as applicable, shall be identification of:

a. Computer equipment that must be present, including amount of memory needed, amount of auxiliary storage needed, and peripheral equipment such as printers and other input/output devices
b. Communications equipment that must be present
b. Other software that must be present, such as operating systems, databases, data files, utilities, and other supporting systems
d. Forms, procedures, or other manual operations that must be present
e. Other facilities, equipment, or resources that must be present

3.4 Software organization and overview of operation. This paragraph shall provide a brief description of the organization and operation of the software from the user's point of view. The description shall include, as applicable:

a. Logical components of the software, from the user's point of view, and an overview of the purpose/operation of each component

b. Performance characteristics that can be expected by the user, such as:

1) Types, volumes, rate of inputs accepted
2) Types, volume, accuracy, rate of outputs that the software can produce
3) Typical response time and factors that affect it
4) Typical processing time and factors that affect it
5) Limitations, such as number of events that can be tracked
6) Error rate that can be expected
7) Reliability that can be expected

c. Relationship of the functions performed by the software with interfacing systems, organizations, or positions

d. Supervisory controls that can be implemented (such as passwords) to manage the software

3.5 Contingencies and alternate states and modes of operation. This paragraph shall explain differences in what the user will be able to do with the software at times of emergency and in various states and modes of operation, if applicable.

3.6 Security and privacy. This paragraph shall contain an overview of the security and privacy considerations associated with the software. A warning shall be included regarding making unauthorized copies of software or documents, if applicable.

3.7 Assistance and problem reporting. This paragraph shall identify points of contact and procedures to be followed to obtain assistance and report problems encountered in using the software.

4. Access to the software. This section shall contain step-by-step procedures oriented to the first time/occasional user. Enough detail shall be presented so that the user can reliably access the software before learning the details of its functional capabilities. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

4.1 First-time user of the software. This paragraph shall be divided into the following subparagraphs.

4.1.1 Equipment familiarization. This paragraph shall describe the following as appropriate:

a. Procedures for turning on power and making adjustments

b. Dimensions and capabilities of the visual display screen

c. Appearance of the cursor, how to identify an active cursor if more than one cursor can appear, how to position a cursor, and how to use a cursor

d. Keyboard layout and role of different types of keys and pointing devices

e. Procedures for turning power off if special sequencing of operations is needed

4.1.2 Access control. This paragraph shall present an overview of the access and security features of the software that are visible to the user. The following items shall be included, as applicable:

a. How and from whom to obtain a password

b. How to add, delete, or change passwords under user control

c. Security and privacy considerations pertaining to the storage and marking of output reports and other media that the user will generate

4.1.3 Installation and setup. This paragraph shall describe any procedures that the user must perform to be identified or authorized to access or install software on the equipment, to perform the installation, to configure the software, to delete or overwrite former files or data, and to enter parameters for software operation.

4.2 Initiating a session. This paragraph shall provide step-by-step procedures for beginning work, including any options available. A checklist for problem determination shall be included in case difficulties are encountered.

4.3 Stopping and suspending work. This paragraph shall describe how the user can cease or interrupt use of the software and how to determine whether normal termination or cessation has occurred.

5. Processing reference guide. This section shall provide the user with procedures for using the software. If procedures are complicated or extensive, additional Sections 6, 7, ... may be added in the same paragraph structure as this section and with titles meaningful to the sections selected. The organization of the document will depend on the characteristics of the software being documented. For example, one approach is to base the sections on the organizations in which users work, their assigned positions, their work sites, or the tasks they must perform. For other software, it may be more appropriate to have Section 5 be a guide to menus, Section 6 be a guide to the command language used, and Section 7 be a guide to functions. Detailed procedures are intended to be presented in subparagraphs of paragraph 5.3. Depending on the design of the software, the subparagraphs might be organized on a function-by-function, menu-by-menu, transaction-by-transaction, or other basis. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

5.1 Capabilities. This paragraph shall briefly describe the interrelationships of the transactions, menus, functions, or other processes in order to provide an overview of the use of the software.

5.2 Conventions. This paragraph shall describe any conventions used by the software, such as the use of colors in displays, the use of audible alarms, the use of abbreviated vocabulary, and the use of rules for assigning names or codes.

5.3 Processing procedures. This paragraph shall explain the organization of subsequent paragraphs, e.g., by function, by menu, by screen. Any necessary order in which procedures must be accomplished shall be described.

5.3.x(Aspect of software use). The title of this paragraph shall identify the function, menu, transaction, or other process being described. This paragraph shall describe and give options and examples, as applicable, of menus, graphical icons, data entry forms, user inputs, inputs from other software or hardware that may affect the software's interface with the user, outputs, diagnostic or error messages or alarms, and help facilities that can provide on-line descriptive or tutorial information. The format for presenting this information can be adapted to the particular characteristics of the software, but a consistent style of presentation shall be used, i.e., the descriptions of menus shall be consistent, the descriptions of transactions shall be consistent among themselves.

5.4 Related processing. This paragraph shall identify and describe any related batch, offline, or background processing performed by the software that is not invoked directly by the user and is not described in paragraph 5.3. Any user responsibilities to support this processing shall be specified.

5.5 Data backup. This paragraph shall describe procedures for creating and retaining backup data that can be used to replace primary copies of data in event of errors, defects, malfunctions, or accidents.

5.6 Recovery from errors, malfunctions, and emergencies. This paragraph shall present detailed procedures for restart or recovery from errors or malfunctions occurring during processing and for ensuring continuity of operations in the event of emergencies.

5.7 Messages. This paragraph shall list, or refer to an appendix that lists, all error messages, diagnostic messages, and information messages that can occur while accomplishing any of the user's functions. The meaning of each message and the action that should be taken after each such message shall be identified and described.

5.8 Quick-reference guide. If appropriate to the software, this paragraph shall provide or reference a quick-reference card or page for using the software. This quick-reference guide shall summarize, as applicable, frequently-used function keys, control sequences, formats, commands, or other aspects of software use.

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document. If section 5 has been expanded into section(s) 6, ..., this section shall be numbered as the next section following section n.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE CENTER OPERATOR MANUAL (SCOM)	**DID-FAA-026-18**

3. DESCRIPTION/PURPOSE

3.1 The Software Center Operator Manual (SCOM) provides personnel in a computer center or other centralized or networked software installation information on how to install and operate a software system.

3.2 SCOM is developed for software systems that will be installed in a computer center or other centralized or networked software installation, with users accessing the system via terminals or personal computers or submitting and receiving inputs and outputs in batch or interactive mode.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record information needed by persons who will operate software in a computer center or other centralized or networked software installation, so that the software can be used by others.

7.3 This DID is often used with the Software Input/Output Manual (SIOM) (DID-FAA-26-19). This pair of manuals is an alternative to the Software User Manual (SUM) (DID-FAA-26-17).

7.4 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements

10.2 Content requirements. Content requirements begin on this page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

   1.1 Identification. This paragraph shall contain a full identification of the system and software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

   1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

   1.3 Document overview. This paragraph shall summarize the purpose and contents of this manual and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this manual. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Software summary. This section shall be divided into the following paragraphs.

   3.1 Software application. This paragraph shall provide a brief description of the intended uses of the software. Capabilities, operating improvements, and benefits expected from its use shall be described.

   3.2 Software inventory. This paragraph shall identify all software files, including databases and data files, that must be installed for the software to operate. The identification shall include security and privacy considerations for each file and identification of the software necessary to continue or resume operation in case of an emergency.

   3.3 Software environment. This paragraph shall identify the hardware, software, manual operations, and other resources needed to install and operate the software. Included, as applicable, shall be identification of:

      a. Computer equipment that must be present, including amount of memory needed, amount of auxiliary storage needed, and peripheral equipment such as terminals, printers, and other input/output devices.

b. Communications equipment that must be present

c. Other software that must be present, such as networking software, operating systems, databases, data files, utilities, permanent files that are referenced, created, or updated by the software; and databases/data files necessary to resume operation in the event of emergencies

d. Forms, procedures, or other manual operations that must be present

e. Other facilities, equipment, or resources that must be present

3.4 Software organization and overview of operation. This paragraph shall provide a brief description of the organization and operation of the software from the operator's point of view. The description shall include, as applicable:

a. Logical components of the software, from the operator's point of view, and an overview of the purpose/operation of each component.

b. Types of inputs/access that can be made to the software and the software's response to each type.

c. The reports and other outputs that are produced by the software, including security and privacy considerations for each.

d. Typical run times and factors that affect it.

e. Organization of software operation into runs. This description shall use a chart, if applicable, showing how the different operations are interrelated. If sets of runs are grouped by time periods or cycles, each set of integrated operations required on a daily, weekly, etc., basis shall be presented. If runs may be grouped logically by organizational level, the groups of runs that can be performed by each organizational level such as headquarters processing, field activity processing, etc., shall be presented.

f. Any system restrictions, waivers of operational standards, information oriented toward specific support areas (for example, library, small computer and teleprocessing support, interfaces with other systems), or other special aspects of processing.

g. General description of the communications functions and processes of the software, including, as applicable, a diagram of the communications network used in the system.

3.5 Contingencies and alternate states and modes of operation. This paragraph shall explain the differences in software operation at times of emergency and in various states and modes of operation, if applicable.

3.6 Security and privacy. This paragraph shall contain an overview of the security and privacy considerations associated with the software. A warning shall be included regarding making unauthorized copies of software or documents, if applicable.

3.7 Assistance and problem reporting. This paragraph shall identify points of contact and procedures to be followed to obtain assistance and report problems encountered in operating the software.

4. Installation and setup. This paragraph shall describe any procedures that the operator must perform to install the software on the equipment, to configure the software, to delete or overwrite former files or data, and to enter parameters for software operation. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

5. Description of runs. This section shall be divided into the following paragraphs to provide a description of the runs to be performed. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

5.1 Run inventory. This paragraph shall provide a list of the runs to be performed, identifying the software and the jobs that make up each run. It shall include a brief summary of the purpose of each run and shall relate the list to the run descriptions included in the remainder of this section.

5.2 Phasing. This paragraph shall describe acceptable phasing of the software into a logical series of operations. A run may be phased to permit manual or semiautomatic checking of intermediate results, to provide the user with intermediate results for other purposes, or to permit a logical break if higher priority jobs are submitted. An example of the minimum division for most systems would be edit, file update, and report preparation.

5.3 Diagnostic procedures. This paragraph shall provide the setup and execution procedures for any software diagnostics. Included shall be procedures for validation and trouble shooting. All parameters (both input and output), codes, and range values for diagnostic software shall be explained.

5.4 Error messages. This paragraph shall list all error messages output by the software, along with the meaning and corresponding correction procedure for each message.

5.5 Description of each run. This paragraph shall be divided into the following subparagraphs.

5.5.x Run description for (run name or identifier). This paragraph shall identify a run and shall be divided into the following subparagraphs to describe the run.

5.5.x.1 Control inputs. This paragraph shall provide a listing of the run stream of job control statements needed to initiate the run.

5.5.x.2 Run management information. This paragraph shall provide the information needed to manage the run including, as applicable:

a. Peripheral and resource requirements
b. Security and privacy considerations
c. Method of initiation, such as on request, after another run, or at a predetermined time
d. Estimated run time
e. Required turnaround time
f. Messages and responses
g. Procedures for taking check points
h. Waivers from operational standards

5.5.x.3 Input-output files. This paragraph shall provide information about the files and databases that serve as input to or that are created or updated by the run. Included for each shall be information such as name, security and privacy, recording medium, retention schedule, and disposition.

5.5.x.4 Output reports. This paragraph shall provide information about the reports that are produced during the run. Included for each report shall be the following information, as applicable: report identifier, product control number, report control symbol, title, security and privacy, media (e.g., hard copy, magnetic tape), volume of report, number of copies, and distribution of copies.

5.5.x.5 Reproduced output reports. This paragraph shall provide information about computer-generated reports that are subsequently reproduced by other means. Included for each report shall be information such as report identification, security and privacy, reproduction technique, paper size, binding method, number of copies, and distribution of copies.

5.5.x.6 Procedures for restart/recovery and continuity of operations. This paragraph shall provide procedures to be followed by operator personnel concerning restart/recovery in the event of a system failure and for continuity of operations in the event of emergencies.

6. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE INPUT/OUTPUT MANUAL (SIOM)	DID-FAA-026-19

3. DESCRIPTION/PURPOSE

3.1 The Software Input/Output Manual (SIOM) tells a user how to access, submit inputs to, and interpret output from, a batch or interactive software system that is run by personnel in a computer center or other centralized or networked software installation.

3.2 The SIOM is developed for software systems that will be installed in a computer center or other centralized or networked software installation, with users accessing the system via terminals or personal computers or submitting and receiving inputs and outputs in batch mode.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
NONE	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record information needed by persons who will submit inputs to, and receive outputs from, software, relying on others to operate the software in a computer center or other centralized or networked software installation.

7.3 This DID is often used with the Software Center Operator Manual (SCOM) (DID-FAA-026-18)

7.4 This pair of manuals is an alternative to the Software User Manual (SUM) (DID-FAA-026-17).

7.5 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10. PREPARATION INSTRUCTIONS -- 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain a full identification of the system and the software to which this document applies, including, as applicable, identification number(s), title(s), abbreviation(s), version number(s), and release number(s).

1.2 System overview. This paragraph shall briefly state the purpose of the system and the software to which this document applies. It shall describe the general nature of the system and software; summarize the history of system development, operation, and maintenance; identify the project sponsor, acquirer, user, developer, and support agencies; identify current and planned operating sites; and list other relevant documents.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this manual and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this manual. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Software summary. This section shall be divided into the following paragraphs.

3.1 Software application. This paragraph shall provide a brief description of the intended uses of the software. Capabilities, operating improvements, and benefits expected from its use shall be described.

3.2 Software inventory. This paragraph shall identify the software files, if any, including databases and data files, that the user is responsible for requesting in order to access the software described in this manual. The identification shall include security and privacy considerations for each file and identification of the software necessary to continue or resume operation in case of an emergency.

3.3 Software environment. This paragraph shall identify the hardware, software, manual operations, and other resources needed to access and use the software. This paragraph shall be based on the assumption that the software is installed in a computer center or other centralized or networked environment and shall focus on the resources that a user must have to access and use the software in that environment. Included, as applicable, shall be identification of:

a. Computer equipment that must be present, such as terminals, printers, or other input/output devices
b. Communications equipment that must be present
c. Other software that must be present, such as networking software
d. Forms, procedures, or other manual operations that must be present
e. Other facilities, equipment, or resources that must be present

3.4 Software organization and overview of operation. This paragraph shall provide a brief description of the organization and operation of the software from the user's point of view. The description shall include, as applicable:

a. Logical components of the software, from the user's point of view, including databases and data files the user can access, Database Management Systems (DBMSs), and communications paths, and an overview of the purpose/operation of each component

b. Performance characteristics that can be expected by the user, such as:
   1) Types, volumes, rate of inputs accepted
   2) Types, volume, accuracy, rate of outputs that the software can produce
   3) Typical response time and factors that affect it
   4) Typical processing time and factors that affect it
   5) Limitations, e.g, restrictions on what data may from what location
   6) Error rate that can be expected
   7) Reliability that can be expected

c. Relationships of the functions performed by the software with interfacing systems and with the organizations or stations that are sources of input or recipients of output

d. Supervisory controls that can be implemented (such as passwords) to manage the software

3.5 Contingencies and alternate states and modes of operation. This paragraph shall explain the differences in what the user will be able to do with the software at times of emergency and in various states and modes of operation, if applicable.

3.6 Security and privacy. This paragraph shall contain an overview of the security and privacy considerations associated with the software. A warning shall be included regarding making unauthorized copies of software or documents, if applicable.

3.7 Assistance and problem reporting. This paragraph shall identify points of contact and procedures to be followed to obtain assistance and report problems encountered in using the software.

4. Using the software. This section shall be divided into the following paragraphs to describe how to prepare inputs to, and interpret output from, the software. If the software has a query capability, this paragraph shall reference section 5 for a description of this capability. If the software can be accessed via terminal, this paragraph shall reference Sections 6 through n to describe terminal processing procedures. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

4.1 Initiation procedures. This paragraph shall contain the procedures that must be followed to initiate use of the software. Included may be information such as sample job request forms or sample control statements.

4.2 Description of inputs. This paragraph shall be divided into the following subparagraphs.

4.2.1 Input conditions. This paragraph shall describe the conditions to be observed in preparing each type or class of input to the software. The conditions shall include the following, as applicable:

a. Reason for input, such as normal status report, need to update data
b. Frequency of input, such as monthly, on demand
c. Origin of input, such as the organization or station authorized to generate the input
d. Medium of input, such as magnetic tape
e. Related inputs that are required to be entered at the same time as this input
f. Other applicable information, such as priority; security and privacy considerations

4.2.2 Input formats. This paragraph shall illustrate the layout formats to be used in the preparation of inputs to the software and shall explain the information that may be entered in the various sections and lines of each format.

4.2.3 Composition rules. This paragraph shall describe any rules and conventions that must be observed to prepare inputs. The rules of syntax, usage of punctuation, etc., shall be explained. The rules shall include the following, as applicable:

a. Input transaction length, such as 100 characters maximum
b. Format conventions, such as all input items must be left-justified
c. Labeling, such as usage of identifiers to denote major data sets to the software
d. Sequencing, such as order and placement of items in the input
e. Punctuation, such as spacing and use of symbols (virgule, asterisk, character combinations, etc.) to denote start and end of input, of data groups, and of fields
f. Restrictions, such as rules forbidding use of particular characters or parameter sets

4.2.4 Input vocabulary. This paragraph shall explain the legal character combinations or codes that must be used to prepare inputs. An appendix may be provided containing an ordered listing of these codes.

4.2.5 Sample inputs. This paragraph shall provide examples that illustrate and explain each type or class of input acceptable by the software. Included shall be information on the following types of inputs, as applicable:

a. Headers denoting the start of input
b. Text or body of the input
c. Trailers denoting the end of input
d. Portions of the input that may be omitted
e. Portions of the input that may be repeated

4.3 Description of outputs. This paragraph shall be divided into the following subparagraphs.

4.3.1 General description. This paragraph shall provide the following information, as applicable, for each type or class of output:

a. Reasons why the output is generated
b. Frequency of the output, such as monthly, on demand
c. Any modifications or variations of the basic output that are available
d. Media, such as printout, display screen, tape
e. Location where the output will appear, such as in the computer area or remotely
f. Any additional characteristics, such as priority, security and privacy considerations, associated outputs that complement the information in this output

4.3.2 Output formats. This paragraph shall illustrate and explain the layout of each type or class of output from the software. The following aspects shall be explained, as applicable:

a. Security and privacy markings
b. Data that may appear in headers
c. Information that may appear in the body or text of the output, including column headings and subsets or sections in the output format
d. Data that may appear in trailers
e. Additional characteristics, such as the meaning of special symbols

4.3.3 Sample outputs. This paragraph shall provide illustrations of each type or class of output from the software. A description of each sample shall be provided, including, as applicable:

a. Meaning and use of each column, entry, etc.
b. Source, such as extracted from database, calculated
c. Characteristics, such as when omitted, range of values, unit of measure

4.3.4 Output vocabulary. This paragraph shall describe any codes or abbreviations that appear in the output that differ from those used in the input described in paragraph 4.2.4.

4.4 Use of outputs. This paragraph shall explain the use of the output by the operational area or activity that receives it.

4.5 Recovery and error correction procedures. This paragraph shall list the error codes generated by the software, give their meanings, and describe the corrective actions to be taken by the user. Also included shall be the procedures to be followed by the user with respect to restart, recovery, and continuity of operations in the event of emergencies.

4.6 Communications diagnostics. This paragraph shall describe the diagnostic procedures available to the user for validating communications and for identifying and classifying problems.

5. Query procedures. This section shall be prepared for software with a query capability. It shall be divided into the following paragraphs.

5.1 Database/data file format. This paragraph shall provide a user's view of the format and content of each database and data file that can be queried. Figure 1 provides an example. Information such as the following shall be provided for each data element, as applicable:

a. Data element name
b. Synonymous names
c. Definition
d. Format
e. Range and enumeration of values
f. Unit of measurement
g. Data item names, abbreviations, and codes

5.2 Query capabilities. This paragraph shall identify and describe the preprogrammed and ad hoc query capabilities provided by the software. An example of preprogrammed queries is shown in Figure 2.

5.3 Query preparation. This paragraph shall provide instructions for preparing queries. Figure 3 shows an example of the format for a preprogrammed query. Figure 4 shows an example of a query statement.

5.4 Control instructions. This paragraph shall provide instructions for the sequencing of runs and other actions necessary to extract responses to query requests. These instructions shall include control statements that may be required by the computer system or software.

6. User terminal processing procedures. This section shall be divided into the following paragraphs to provide the user with information on the use of terminals to accomplish processing. If the procedures are complicated or extensive, Sections 7 through n may be added in the same paragraph structure as this section and with titles meaningful to the sections selected. The organization of the document will depend on the characteristics of the software being documented. For example, sections might be based on the organizations in which users work, their assigned positions, work sites, or the tasks they must perform. For other software, it may be more appropriate to have Section 6 be a guide to menus, Section 7 be a guide to the command language, and Section 8 be a guide to functions. Detailed procedures are intended to be presented in paragraphs 6.2 through 6.5. Depending on the design of the software, the subparagraphs might be organized on a function-by-function, menu-by-menu, transaction-by-transaction, or other basis. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

6.1 Available capabilities. This paragraph shall describe in general terms the capabilities for retrieval, display, and update of data through terminal operations.

6.2 Access procedures. This paragraph shall present the sequence of steps and any applicable rules pertaining to accessing the software to initiate software operations.

6.3 Display, updates, and retrieval procedures. This paragraph shall be divided into subparagraphs to provide the step-by-step procedures necessary to produce the displays, updates, and retrievals that are available through the use of a terminal. Each procedure shall include the name of the operation, input formats, and sample responses, as applicable.

6.4 Recovery and error correction procedures. This paragraph shall identify error messages that may be displayed and shall indicate their meanings and any corrective actions that should be taken. Also included shall be any procedures to be followed by the user with respect to restart, recovery, and continuity of operations in the event of emergencies.

6.5 Termination procedures. This paragraph shall present the sequence of steps necessary to terminate the processing.

7. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document. If section 6 has been expanded into section(s) 7,..., this section shall be numbered as the next section following section n.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

FIGURE 1. EXAMPLE OF DATA RECORD FORMAT

Format of Data Record				
Item Name:	Format:		Range of Values	Unit of Measurement
ORG-NAME	30	AN	1-9, A-Z	
ORG-ID	6	AN	1-9, A-Z	
SOC-SEC-NO	9	N	'----	
NAME	20	AN	'----	
PAY-GRADE	4	AN	0-9	DOLLARS
GROSS-PAY	6	SN	0-9	DOLLARS
GROSS-PAY-YTD	8	SN	0-9	DOLLARS
FED-TAX	6	SN	0-9	DOLLARS
FED-TAX-YTD	8	SN	0-9	DOLLARS
FICA	6	SN	0-9	DOLLARS
FICA-YTD	8	SN	0-9	DOLLARS
STATE-TAX	6	SN	0-9	DOLLARS
STATE-TAX-YTD	8	SN	0-9	DOLLARS
STATE-TAX-CODE	2	AN	B3-F6	
ALLOTMENTS	6	SN	0-9	DOLLARS
NET-PAY	6	SN	0-9	DOLLARS

AN = Alphanumeric
SN = Signed Numeric

FIGURE 2. EXAMPLE OF PREPROGRAMMED QUERY CAPABILITY

PREPROGRAMMED QUERY CAPABILITIES	
DESCRIPTION:	QUERY CODES
Number of employees within an organization	A
Number of employees in a specific pay grade	B
Total gross pay for employees within an organization	C
State tax year-to-date for specific state	D
FICA tax year-to-date for a specific employee	E
Total deductions for a specific employee	F
Net pay for a specific employee	G

FIGURE 3. EXAMPLE OF QUERY FORMAT

FORMAT OF QUERY A			
NUMBER OF EMPLOYEES WITHIN AN ORGANIZATION			
QUERY ITEM TITLE	CHARACTER POSITION		CONTENT/ COMMENT
Query Designator	1	Q	Constant
File Number	2-3	Q1	Constant
Query Number	4-5		Insert 01-99
Security classification	10	U	Unclassified
Query Card Format Code	12	A	
Organization	14-19		Insert ORG-ID As requested by the Query. Refer to data Format for applicable code.

FIGURE 4. EXAMPLE OF QUERY STATEMENT

QUERY STATEMENT
Request – No. of employees within an organization (Office of Information)
Query Statement – If ORG-ID AIO List no of employees

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
COMPUTER OPERATION MANUAL (COM)	DID-FAA-026-20

3. DESCRIPTION/PURPOSE

3.1 The Computer Operation Manual (COM) provides information needed to operate a given computer and its peripheral equipment. This manual focuses on the computer itself, not on particular software that will run on the computer.

3.2 The COM is intended for newly developed computers, special-purpose computers, or other computers for which commercial or other operation manuals are not readily available.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record information needed to operate the computer(s) on which software will run.

7.3 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, CALS, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" In this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2-4)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A : Approved for public release; distribution is unlimited.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the next page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

10. PREPARATION INSTRUCTIONS -- 10.2 Content Requirements (continued)

1. Scope. This section shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall contain the manufacturer's name, model number, and any other identifying information for the computer system to which this COM applies.

1.2 Computer system overview. This paragraph shall briefly state the purpose of the computer system to which this COM applies.

1.3 Document overview. This paragraph shall summarize the purpose and contents of this manual and shall describe any security or privacy considerations associated with its use.

2. Referenced documents. This section shall list the number, title, revision, and date of all documents referenced in this manual. This section shall also identify the source for all documents not available through normal Government stocking activities.

3. Computer system operation. This section shall be divided into the following paragraphs. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

3.1 Computer system preparation and shutdown. This paragraph shall be divided into the following subparagraphs.

3.1.1 Power on and off. This paragraph shall contain the procedures necessary to power-on and power-off the computer system.

3.1.2 Initiation. This paragraph shall contain the procedures necessary to initiate operation of the computer system, including, as applicable, equipment setup, pre-operation, bootstrapping, and commands typically used during computer system initiation.

3.1.3 Shutdown. This paragraph shall contain the procedures necessary to terminate computer system operation.

3.2 Operating procedures. This paragraph shall be divided into the following subparagraphs. If more than one mode of operation is available, instructions for each mode shall be provided.

3.2.1 Input and output procedures. This paragraph shall describe the input and output media (e.g., magnetic disk, tape) relevant to the computer system, state the procedures to read and write on these media, briefly describe the operating system control language, and list procedures for interactive messages and replies (e.g, terminals to use, passwords, keys).

3.2.2 Monitoring procedures. This paragraph shall contain the procedures to be followed for monitoring the computer system in operation. It shall describe available indicators, interpretation of those indicators, and routine and special monitoring procedures to be followed.

3.2.3 Off-line procedures. This paragraph shall contain the procedures necessary to operate all relevant off-line equipment of the computer system.

3.2.4 Other procedures. This paragraph shall contain any additional procedures to be followed by the operator (e.g., computer system alarms, computer system security or privacy considerations, switch over to a redundant computer system, or other measures to ensure continuity of operations in the event of emergencies).

3.3 Problem-handling procedures. This paragraph shall identify problems that may occur in any step of operation described in the preceding paragraphs in Section 3. It shall state the error messages or other indications accompanying those problems and shall describe the automatic and manual procedures to be followed for each occurrence, including, as applicable, evaluation techniques, conditions requiring computer system shutdown, procedures for on-line intervention or abort, steps to be taken to restart computer system operation after an abort or interruption of operation, and procedures for recording information concerning a malfunction.

4. Diagnostic features. This section shall be divided into the following paragraphs to describe diagnostics that may be performed to identify and troubleshoot malfunctions in the computer system.

4.1 Diagnostic features summary. This paragraph shall summarize the diagnostic features of the computer system, including error message syntax and hierarchy for fault isolation. This paragraph shall describe the purpose of each diagnostic feature.

4.2 Diagnostic procedures. This paragraph shall be divided into subparagraphs as needed to describe the diagnostic procedures to be followed for the computer system, including:

a. Identification of hardware, software, or firmware necessary for executing each procedure

b. Step-by-step instructions for executing each procedure

c. Diagnostic messages and the corresponding required action

4.3 Diagnostic tools. This paragraph shall be divided into subparagraphs as needed to describe the diagnostics tools available for the computer system. These tools may be hardware, software, or firmware. This paragraph shall identify each tool by name and number and shall describe the tool and its application.

5. Notes. This section shall contain any general information that aids in understanding this document (e.g., background information, glossary, rationale). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document and a list of terms and definitions needed to understand this document.

A. Appendixes. Appendixes may be used to provide information published separately for convenience in document maintenance (e.g., charts, classified data). As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided. Appendixes may be bound as separate documents for ease in handling. Appendixes shall be lettered alphabetically (A, B, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
COMPUTER PROGRAMMER'S MANUAL (CPM)	DID-FAA-026-21

3. DESCRIPTION/PURPOSE

3.1 This Data Item Description (DID) contains the format and content preparation instructions for the data generated under the work task described by specific requirements as delineated in the contract.

3.2 The CPM provides the information may be used to interpret, check out, troubleshoot, or modify existing software on the host and target computers.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media. If electronic media is selected, the precise format must be specified.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document. The index shall also include the pages or paragraphs in which the terms and concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur on in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard Data Descriptions. If a description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitute of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on this page. The numbers shown designate the paragraph numbers to be used in the document.

10.2.1 Scope. This section shall be numbered 10.2 and shall be divided into the following paragraphs:

10.2.1.1 Identification. This paragraph shall contain the manufacturer's name, model number, and any other identifying information for the computer system to which this document applies.

10.2.1.2 Computer System Overview. This paragraph shall briefly state the purpose of the computer system to which this document applies.

10.2.1.3 Document Overview. This paragraph shall summarize the purpose and contents of this manual and shall describe any security and privacy considerations associated with its use.

10.3 Referenced documents. This paragraph shall list the number, title, revision, and date of all documents referenced in this manual.

10.4 Programming Environment. This paragraph shall be divided into paragraphs to provide the following information:

a. The components and configuration of the computer system.
b. Operating characteristics, capabilities, and limitations, including, as applicable:
   1.) Machine cycle time
   2.) Word length
   3.) Memory capacity and characteristics
   4.) Instruction set characteristics
   5.) Interrupt capabilities
   6.) Modes of operation (e.g. batch, interactive, privileged, non- privileged)
   7.) Operational registers
   8.) Error indicators
   9.) Input/Output characteristics, and
   10.) Special features

c. Description of the equipment (e.g. tapes, disks, other peripheral equipment) necessary to perform compilations and assemblies on the computer system. Identify (as applicable) by name and version number the editor, linker, link-editor, compiler, assembler, cross-compilers, cross-assemblers, and other utilities used, and reference appropriate manuals describing their use. highlight any special flags or instructions necessary for loading, executing, or recording the results.

10.5 Programming Information. This paragraph shall be divided into subparagraphs that provide the following information:

a. Description of the programming features of the computer's instruction set architecture, including, as applicable:
   1.) Data representation (e.g. byte, word, integer, floating-point, double precision)
   2.) Instruction formats and addressing modes
   3.) Special registers and words (e.g. stack pointer, program counter)
   4.) Control instructions (e.g. branch, jump, subroutine and procedure call instructions, privileged instructions, and the modes they operate in).
   5.) Subroutines and procedures (e.g. non-reentrant, reentrant, macrocode routines, argument list, parameter passing conventions).
   6.) Interrupt processing
   7.) Timers and clocks
   8.) Memory protection features (e.g. read-only memory)
   9.) Additional features, such as instruction or data cache architecture

b. Description of each instruction, including, as applicable:
   1.) Use
   2.) Syntax
   3.) Condition codes set
   4.) Execution time
   5.) Machine-code format
   6.) Mnemonic conventions
   7.) Other characteristics

c. Description of input and output control programming, including, as applicable:
   1.) Initial loading and verification of computer memory
   2.) Serial and parallel data channels
   3.) Discrete input and outputs
   4.) Interface components
   5.) Device numbers, operational codes, and memory locations for peripheral equipment

d. Additional, restricted, or special programming techniques associated with the computer system (e.g. concise description of the microprogram control section).

e. Examples that demonstrate the programming features described above, including examples of the proper use of all categories of instructions on the computer system.

f. Error detection and diagnostic features associated with the computer system, including condition codes, overflow and addressing exception interrupts, and input and output error status indicators.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
FIRMWARE SUPPORT MANUAL (FSM)	DID-FAA-026-22

3. DESCRIPTION/PURPOSE

3.1 This Data Item Description (DID) contains the format and content preparation instructions for the data generated under the work task described by specific requirements as delineated in the contract.

The FSM provides the information necessary to load software or data into firmware components of a system. It is equally applicable to read only memory (ROMs), Programmable ROMs (PROMs), Erasable PROMs (EPROMs) and other firmware devices. It also includes the procedures needed to erase firmware devices, load software into the firmware devices, and verify the load processes.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
NONE	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the developer is tasked to identify and record information needed to program and reprogram firmware devices in which software resides.

7.3 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, , or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

10.1 PREPARATION INSTRUCTIONS – 10.1 General Instructions (continued)

c. Title page or identifier. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; and distribution statement. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents and index. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix, and an index providing an alphabetic listing of key terms and concepts covered in the document and the pages or paragraphs in which the terms or concepts are covered. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1. Scope. This section shall be numbered 1 and shall be divided into the following paragraphs.

1.1 Identification. This paragraph shall be numbered 1.1 and shall contain the approved identification number, version numbers, CSCI revision number, title, and abbreviation, if applicable, of the computer system to which this FSM applies. This paragraph shall also identify by name and number, all firmware components to which this FSM applies.

1.2 System overview. . This paragraph shall be numbered 1.2 and shall briefly state the purpose of the system and the software to which this FSM applies.

1.3 Document overview. This paragraph shall be numbered 1.3 and summarize the purpose and contents of this FSM.

1.4 Referenced documents. This paragraph shall be numbered 2 and list the document number and title all documents referenced in this manual.

2 Firmware device information. This paragraph shall be numbered 3 and shall be divided into the following paragraphs to describe the firmware devices.

2.1 Device description. This paragraph shall be numbered 3.1 and shall contain a complete physical description of the firmware components of the system or subsystem. This paragraph shall provide the following for each device:

a. Device name and manufacturer's identification and number
b. Memory size
c. Operating characteristics (e.g. access time, power requirements, logic levels)
d. Pin functional descriptions
e. Logic interfaces (e.g. addressing scheme, chip selection, etc.)
f. Internal and external identification scheme used with each device, and
g. Timing diagrams

2.2 Software to be programmed into the device. This paragraph shall be numbered 3.2 and shall identify by project-unique identifier(s) the software to be programmed into the firmware device.

2.3 Programming equipment. . This paragraph shall be numbered 3.3 and shall describe the equipment to be used for programming and reprogramming the firmware device. It shall include computer equipment, general purpose equipment, and special equipment to be used for device erasure, loading, verification, and marking, as applicable. Each piece of equipment shall be identified by manufacturer's name, model number, and any other pertinent information that uniquely identifies that piece of equipment. A description of each piece of equipment shall be provided, including it's purpose, usage, and major capabilities.

2.4 Programming Hardware. This paragraph shall be numbered 3.4 and shall describe the equipment to be used for programming and reprogramming each firmware device. It shall include computer peripherals, general purpose equipment, and special equipment used for device loading, burn-in, and test (including verification that the proper content is stored). Each piece of equipment shall be identified by manufacture, manufacturer's designation, and any other pertinent 10.2

information that uniquely identifies that piece of equipment. A description of each piece of equipment shall be provided, including it's purpose, usage, and major capabilities.

2.5 Programming software. This paragraph shall be numbered 3.5 and shall describe the software to be used for programming and reprogramming the firmware. It shall include software to be used for device erasure, loading, verification, and marking, as applicable. Each software item shall be identified by vendor's name, software name, version/release, and any other pertinent information that uniquely identifies the software item. A description of each software item shall be provided, including it's purpose, usage, and major capabilities.

2.6 Programming procedures. This paragraph shall be numbered 3.6 and shall describe the Procedures to be used for programming and reprogramming the firmware device. It shall include software to be used for device erasure, loading, verification, and marking, as applicable. All equipment and software necessary for each procedure shall be identified, together with any security and privacy measures to be applied.

3. Installation and repair procedures. This paragraph shall be numbered 4.0 and shall contain the installation, replacement, and repair procedures for the firmware device. This paragraph shall also include remove and replace procedures, device addressing scheme and implementation, description of the host board layout, and the procedures for ensuring continuity of operations in the event of emergencies. Safety precautions, marked by WARNING or CAUTION, shall be included where applicable.

4. Subcontractor or Vendor Information. This paragraph shall be numbered 5.0 and shall include or reference any relevant information supplied by the subcontractor(s) or vendor(s) of the firmware device, programming equipment, or programming software.

5. Appendices. Appendices may be used to provide information published separately for convenience in document maintenance (e.g. background information, charts, classified data). Each appendix shall be listed in the table of contents, and in the main body of the FSM. Appendices shall be numbered alphabetically (e.g. A,B,C, etc.) and pages number using the prefix of that appendix (e.g. A-1, B-1, C-1, etc.).

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE QUALITY ASSURANCE PLAN (SQAP)	DID-FAA-026-23

3. DESCRIPTION/PURPOSE

3.1 The Software Quality Assurance Plan (SQAP) describes Software Quality Assurance activities for software intensive projects.

3.2 The SQAP defines the SQA processes to be followed, the methods to be used, the approach to be followed for providing assurance that software processes and products conform to specified plans and requirements.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

7. APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the contractor is tasked to develop and record plans for conducting Software Quality Assurance activities.

7.3 The Contract Data Requirements List (CDRL) (DD 1423 or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

PREPARATION INSTRUCTIONS: 10.1 General Instructions (continued)

c. Title page or identifier with signature blocks. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. Table of contents. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. Page numbering/labeling. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. Response to tailoring instructions. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. Multiple paragraphs and subparagraphs. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. Standard data descriptions. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. Substitution of existing documents. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown shall designate the paragraph numbers to be used in the document.

PREPARATION INSTRUCTIONS: 10.2 Content Requirements (continued)

10.2.1 Scope. This section shall identify the software and related documentation to which the SQAP applies. It shall also identify any support software necessary for the development of the government product. The paragraph shall begin with the following sentence: "This document describes the Software Quality Assurance Plan to be used throughout the life-cycle of the program including necessary documentation for contract XXXXX (insert title). This plan is also applicable to support software necessary for the design, development and delivery of the product. "

10.2.2 Referenced Documents. This paragraph shall list all documents referenced in the SQAP by document number, title, revision, and date. All documents referenced in the plan shall be available for government review.

10.2.3 Overview of SQA Activities. This paragraph shall be divided into subsections as needed to establish the context for the planning described in later sections. The planning shall cover all contractual clauses regarding the identified topics. It shall include, as applicable, an overview of:

a. Requirements and constraints on the system and software to be developed or used to support the program.
b. Software Quality Assurance Milestone chart which identifies the program SQA/Software Quality Engineering (SQE) required activities by program life cycle phase, including formal reviews and audits.
c. Other requirements and constraints, such as on project security, privacy, methods, standards, interdependencies in hardware and software development, etc.

10.2.3.1 Detailed description of planned SQA/SQE activities: This paragraph shall include a detailed description of the SQA/SQE activities to be performed during the software development life cycle. Describe the responsibilities and authorities for accomplishing the planned software quality assurance activities. Identify the required coordination of software quality assurance activities with other activities of the project. Identify the tools and the physical and human resources required for the execution of the plan. The SQA/SQE activities and tasks shall be mapped onto the appropriate life-cycle model.

10.2.3.2 Software Product Assurance. This paragraph and its subparagraphs shall describe the approach to be followed for software product assurance, including audits and reporting.

10.2.3.2.1 Assure that plans and related documents comply with the contract requirements and are mutually consistent.

10.2.3.2.2 Assure that the software products to be delivered have fully satisfied their contractual requirements and are acceptable to the acquirer.

10.2.3.3 Software Process Assurance. This paragraph and its subparagraphs shall describe the approach to be followed for software process assurance, including audits and reporting.

10.2.3.3.1 Assure that the software life-cycle processes, and supporting processes comply with the contract requirements, including ISO 9001 (if applicable), adhere to project plans and are executed as required.

10.2.3.3.2 Assure that prime contract requirements are passed down to the subcontractor.

10.2.3.3.3 Verify that internal engineering practices, development environment, test environment, and libraries comply with approved processes and contract requirements.

10.2.3.3.4 Verify that metrics for software processes and products are captured and tracked in accordance with established plans and procedures.

10.2.3.3.5 Assure that the assigned staff have the required skills and are properly trained to meet the project requirements.

10.2.3.4 Problem resolution. This paragraph shall describe the approach to be followed for problem resolution, including a description of the problem/change report process and items to be recorded. Candidate items include project name, originator, problem number, problem name, software element or document affected, origination date, category and priority, description, analyst assigned to the problem, date assigned, date completed, analysis time, recommended solution, impacts, problem status, approval of solution, follow-up actions, corrector, correction date, version where corrected, correction time, description of solution implemented.

10.2.3.5 Joint technical and management reviews. This paragraph shall describe the entry and exit criteria required by SQE for joint technical and management reviews.

10.2.3.6 Other SQA/SQE activities. This paragraph shall be describe those activities associated with SQE in the following process areas:

a. Risk management, including potential risks and corresponding handling strategies,
b. Software management indicators, including indicators to be used,
c. Computer Security,
d. Subcontractor management,
e. Interface with software independent verification and validation (IV&V) agents,
f. Coordination with associate developers, and
g. Improvement of project processes.

10.2.3.7 Project organization. This paragraph shall describe the relationship of the SQE organization to the overall project organizational structure, including the organizations involved, their relationships to one another, and the authority and responsibility of each organization for carrying out required activities. This section shall include a description of the mechanism used to ensure the ability to perform objective evaluations and effect problem resolution.

10.2.3.8 Other required resources. This paragraph shall describe a plan for obtaining other required resources, dates needed, and availability of each resource item.

10.3 APPENDIX A - Appendix A shall contain a list of Definitions, Acronyms, & Abbreviations

10.4 APPENDIX B - Appendix B shall provide a “mapping” of the requirements of this plan to contractor internal procedures.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
SOFTWARE CONFIGURATION MANAGEMENT PLAN (SCMP)	**DID-FAA-026-24**

DESCRIPTION/PURPOSE

3.1 The Software Configuration Management Plan (SCMP) shall describe those functions performed by personnel performing Software Configuration Management activities for programs on software intensive projects.

3.2 The SCMP shall be tailored to address the types of software to be included in the project (e.g. newly developed software, modified software, support software, and Commercial-Off-The-Shelf /Non-Developmental Items (COTS/NDI)). Furthermore, it provides the acquirer insight into the software configuration process, the methods to be used, the approach to be followed, and software configuration control. Care should be taken to eliminate tasks that add unnecessary costs and data that do not add value to the process or the product.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

a) APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract.

7.2 This DID is used when the contractor is tasked to develop and record plans for conducting software Configuration Management activities.

7.3 The Contract Data Requirements List (CDRL/DD 1423, or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, , or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
August 11, 2000	AIO-2/ASU-500	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

a. Automated techniques. Use of automated techniques is encouraged. The term "document" in this DID means a collection of data regardless of its medium.

b. Alternate presentation styles. Diagrams, tables, matrices, and other presentation styles are acceptable substitutes for text when data required by this DID can be made more readable using these styles.

(Continued on Page 2)

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.

c. **Title page or identifier with signature blocks**. The document shall include a title page containing, as applicable: document number; volume number; version/revision indicator; security markings or other restrictions on the handling of the document; date; document title; name, abbreviation, and any other identifier for the system, subsystem, or item to which the document applies; contract number; CDRL item number; organization for which the document has been prepared; name and address of the preparing organization; distribution statement; and signature blocks for the developer representative authorized to release the document, the acquirer representative authorized to approve the document, and the dates of release/approval. For data in a database or other alternative form, this information shall be included on external and internal labels or by equivalent identification methods.

d. **Table of contents**. The document shall contain a table of contents providing the number, title, and page number of each titled paragraph, figure, table, and appendix. For data in a database or other alternative form, this information shall consist of an internal or external table of contents containing pointers to, or instructions for accessing, each paragraph, figure, table, and appendix or their equivalents.

e. **Page numbering/labeling**. Each page shall contain a unique page number and display the document number, including version, volume, and date, as applicable. For data in a database or other alternative form, files, screens, or other entities shall be assigned names or numbers in such a way that desired data can be indexed and accessed.

f. **Response to tailoring instructions**. If a paragraph is tailored out of this DID, the resulting document shall contain the corresponding paragraph number and title, followed by "This paragraph has been tailored out." For data in a database or other alternative form, this representation need occur only in the table of contents or equivalent.

g. **Multiple paragraphs and subparagraphs**. Any section, paragraph, or subparagraph in this DID may be written as multiple paragraphs or subparagraphs to enhance readability.

h. **Standard data descriptions**. If a data description required by this DID has been published in a standard data element dictionary specified in the contract, reference to an entry in that dictionary is preferred over including the description itself.

i. **Substitution of existing documents**. Commercial or other existing documents may be substituted for all or part of the document if they contain the required data.

10.2 Content requirements. Content requirements begin on the following page. The numbers shown designate the paragraph numbers to be used in the document. Each such number is understood to have the prefix "10.2" within this DID. For example, the paragraph numbered 1.1 is understood to be paragraph 10.2.1.1 within this DID.

1 **Scope**. This paragraph shall identify the software configuration items (SCIs) that this document applies to. If this SCMP contains CM plans for all software, and all types of software (e.g., newly developed software, support software, COTS/NDI), to be supplied with the system, then this paragraph shall indicate so.

2 **Purpose** This paragraph shall state the purpose of the system, and identify the functions of the software to which this SCMP applies.

3 **Organizational Structure**. This paragraph shall describe the organization (s) responsible for performing software CM. Authority and responsibility of each organization and its relationship to other organizations (e.g., software quality assurance) shall be described.

4 **Configuration Management Activities**

4.1 **Configuration Identification** This paragraph shall contain the following subparagraphs as applicable.

4.1.1 **Developmental Configuration** This subparagraph shall identify the contractor's internal developmental configuration(s) to be used in the development of the software. For each developmental configuration identified, the methods of establishing it shall be described and the contents shall be listed. For example, the engineering release of the first draft of the Software Design Description shall establish the internal Developmental Configuration.

4.1.2 **SCI and Related Documentation** This subparagraph shall describe the methods to be used in identifying (e.g., naming, marking, numbering) the components of the SCI and related documents. This paragraph shall also describe how revisions to software components are identified.

4.2 **Configuration Control**. This paragraph shall be divided into the following subparagraphs to provide a detailed description of the procedures to be used in controlling changes to and maintaining the Developmental Configuration(s).

4.2.1 **Flow of Configuration Control**. This subparagraph shall describe the process by which problems and changes are submitted, reviewed, and subsequently approved or disapproved. This description may be accomplished graphically by a configuration control flow chart.

4.2.2 **Report for Software Problems and Changes** This paragraph shall identify and describe the format used to document software problems and changes detected during software development. This report shall include the following information, or equivalent:

a) **Subsystem or Project Name** - The name of the subsystem or development project to which this report applies

b) **Originator** - The name, telephone number, and designator of the organization submitting the report

c) **Problem Number** – The assigned problem number (once a problem number has been assigned in accordance with established project configuration control procedures).

d) **Problem Name** – A brief phrase descriptive of the problem and descriptive of a similar problem, if applicable.

e) **Software Element of Document Affected** - The specific software element(s), document(s), paragraph(s), or both to which the report applies, including appropriate configuration identification and version number, if applicable. Include all established baselines for developmental configurations affected.

f) **Origination Date** – The date the report is first submitted.

g) **Need Date or Priority** - The date the fix is needed in order to maintain established schedules or priority in accordance with established standards.

h) **Description of Problem** - A description of the problem and the conditions, inputs, and equipment configuration under which the problem arises. A description of the activities leasing up to the problem occurrence. Sufficient problem information to permit duplication and analysis. Include relationship to other reported problems and modifications.

i) **Analyst** - The name, telephone number, and organization of the individual assigned to analyze the problem.

j) **Date Assigned** – The date the analyst was assigned.

k) **Date Complete** - The date the analysis was completed.

l) **Analysis Time** - The time required to analyze the problem report.

m) **Recommended Solution** - After analysis of the problem, the recommended solution and alternative solutions, if available and the nature of the recommended solution by a short descriptive phase. When applicable, supporting rationale and test results shall be included.

n) **Impacts** - The cost, schedule, and interface impacts if the solution is approved. Also, performance impacts if the solution is not approved. As applicable, include the impact on the other systems, configuration items, other contractors, system employment, integrated logistics support, system resources, training, etc.

o) **Problem Status** - The problem status designated by the configuration control procedures.

p) **Approval of Solution** - To be designated by the cognizant configuration control authority.

q) **Follow-up Action** - Actions following resolution of the problem.

r) **Corrector** - The name, telephone number, and organization of the individual correcting the problem.

s) **Correction Date** - The date the problem was corrected.

t) **Version Number** - The version in which the problem will be corrected.

u) **Correction Time** - The time required to correct the problem.

v) **Implementation Solution** - A brief description of the implemented solution to the problem.

4.2.3 **Review Procedures**. This paragraph shall describe the purpose of and the procedures to be employed by any review boards (e.g., Software Configuration Control Board) associated with the flow of configuration control. This paragraph shall also describe how the procedures used by any Review Boards, in conjunction with the configuration identification scheme, provide historical traceability.

4.2.3.1 **Review Board X (insert title) Procedures**. This subparagraph shall describe the purpose of and the procedures to be followed by Review Board X. This subparagraph shall also describe how the procedures used by Review Board X, in conjunction with the configuration identification scheme, to provide historical traceability.

4.2.4 **Storage, Handling and Release of Project Media**. This paragraph shall describe the methods to formally control the storage, handling, and release of software and documentation (including master copies) during the development process.

4.2.5 **Source Code Control** . This paragraph shall describe the restrictions applied in order to assure the integrity of source code. It is essential that control (either initial input or changes) be restricted to authorized individuals. The controls described in the configuration management plan shall address the levels of control required for code entry, change, access and distribution.

4.3 **Relationship to Quality Program Plan**. The contractor shall describe the interrelationship in each of the elements of configuration management with the quality program functions and indicate those relationships in the quality program plan.

4.4 **Additional Control**. This paragraph shall identify any additional configuration control activities not discussed above.

4.5 **Configuration Status Accounting**. This paragraph shall define the configuration status accounting system. The content, format, and purpose of the status accounting records and reports shall be described.

4.6 **Configuration Audits**. This paragraph shall describe the procedures for conducting configuration audits. The description of how the configuration status accounting reports and records will be used in conducting these audits shall be included.

4.7 **Preparation for Configuration Authentication**. This paragraph shall describe the contractor's procedures to prepare for and respond to authentication of the applicable specifications. As a minimum, this subparagraph shall include the procedures for:

a. Submitting specifications to the contracting agency for review and authentication.

b. Ensuring the incorporation of approved changes.

c. Updating the configuration status accounting reports to reflect approved baseline(s).

4.8 **Configuration Management Major Milestones**. This paragraph shall identify the major internal and Government CM-related milestones for the life cycle phase(s) of the contractual effort.

5 **NOTES**

This section shall contain any general information that aids in understanding this document (e.g., background information, glossary). This section shall include an alphabetical listing of all acronyms, abbreviations, and their meanings as used in this document.

6 **APPENDIXES**

Appendixes may contain any supplemental information published separately for convenience in document maintenance (e.g., charts, classified data). Appendixes may be bound as separate documents for ease in handling. Appendixes shall be numbered sequentially in Roman numeral (I, II, etc.), and the paragraphs within each appendix shall all be numbered as multiples of 10 (e.g., Appendix I, paragraph 10.1, 10.2, Appendix II, paragraph 20.1, 20.2, etc.).

As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided.

DATA ITEM DESCRIPTION

1. TITLE	2. IDENTIFICATION NUMBER
COMPUTER PROGRAM FUNCTIONAL SPECIFICATION (CPFS)	DID-FAA-026-25

DESCRIPTION/PURPOSE

The Computer Program Functional Specification (CPFS) shall describe and document the design of small computer programs and individual logical partitions of large computer programs.

4. APPROVAL DATE (YYMMDD)	5. OFFICE OF PRIMARY RESPONSIBILITY (OPR)	6a. DTC APPLICABLE	6b. GIDEP APPLICABLE
August 11, 2000	AIO-2/ASU-500	N/A	N/A

a) APPLICATION/INTERRELATIONSHIP

7.1 This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by specific and discrete task requirements as delineated in the contract. The CPFS shall be developed in accordance with *Software Documentation Standards for Program Development* (FAA-SRDS-140-SDS-1, April 1975).

7.2 This DID is used when the contractor is tasked to develop and implement a CPFS.

7.3 The Contract Data Requirements List (CDRL/DD 1423, or equivalent) should specify whether deliverable data are to be delivered on paper or electronic media; are to be in a given electronic form (such as ASCII, or compatible with a specified word processor or other support software); may be delivered in developer format rather than in the format specified herein; and may reside in a computer-aided software engineering (CASE) or other automated tool rather than in the form of a traditional document.

8. APPROVAL LIMITATION	9a. REFERENCES	9b. AMSC NUMBER
NONE	FAA-STD-026	N/A

10. PREPARATION INSTRUCTIONS

10.1 General instructions.

Format The Computer Program Functional Specification shall be typed or printed on 8 ½ " X 11" bond paper.

Content The Computer Program Functional Specification content shall be in accordance with FAA-SRDS-140-SDS-1, Chapter 6.

11. DISTRIBUTION STATEMENT

DISTRIBUTION STATEMENT: Approved for public release; distribution is unlimited.